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THE BRICKBVILDER

OFFICE 85 WATER STREET BOSTON

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF ARCHITECTURE IN MATERIALS OF CLAY.

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COLORED BRICK.

THERE was a time, not very long since, when to designate anything as being brick color was equivalent to saying it was a deep, dull red, and no other tone but red was thought of in connection with burnt clay for building material. But when the newer shades of brick began to be considered, all this was changed, and our constructors very speedily found themselves in possession of a great variety of tones, ranging from almost jet black through chocolate colors, browns, reds, buffs, and grays, to the pale yellows and whites. The whole subject of colored bricks was an innovation, for a while at least, and in the natural efforts to provide the designer with all the required shades, to place any suitable color at his disposal, the multiplying of colored bricks increased perhaps beyond measure. Certainly for a while we had a surfeit of some of the lighter shades of brick, to an extent which was bound to bring about a reaction, especially as in a great many cases very little care had been exercised in selecting the particular color. We have known repeated instances where a strong-colored mottled brick looked about perfect in one locality or in one design, when the identical shade used on a different side of the street, with different surroundings, seemed harsh and totally out of place. Consequently the manufacturers of our colored bricks have sometimes had to beware of their friends, and have suffered because of injudicious selection to an extent which has been prejudicial to the use of some of the best shades. Again, the colored brick have not always been made with the most care. Some of the companies have put out products which have hurt the trade a great deal, and the cheap manufacturers of poor brick have imitated all the shades produced by better companies, so that it is not unnatural to expect a reaction in favor of red brick. We notice in one of our contemporaries statements to the effect that red brick is returning to favor and that the use of the lighter tones of brick are a passing fashion, which is likely to be superseded by the use very largely of the old-fashioned red brick, and it quotes a number of buildings in New York, which have been constructed entirely of the darker shades, arguing from this that the colored bricks are doomed. We do not at all share this belief. We have always admired red brick, and in its place it is an excellent tone, blending admirably with its surroundings and adapting itself to many different styles of design, but he would be a poor designer indeed who felt constrained to limit himself to any one tone or quality, either light or dark. The dreary monotony of continuous rows of sad, overdone bricks is to be deplored, no matter what the particular tone may be. There are a good many incipient shades now in the market which could well be spared, but there are certain shades of buff, pale red, and mottled browns which we believe will always remain in favor, and will always be used by thinking designers in producing certain effects. Again, some of the shades of gray have come to stay, and have been a factor in some of our best buildings, without suggesting in the slightest degree a forced use of either color or material; while as for white brick in its various modifications, there is every indication to believe that its use is only just beginning to be appreciated, and that in the near future it will command a much larger measure of appreciation than has heretofore been awarded it. To build a structure in strict conformity to any one type is not a course most calculated to develop good architecture. The individuality of ideas which is so prominent in our modern work has received no inconsiderable measure of its strength from the opportunities for real color which have been afforded by our brick manufacturers, and we have every reason to believe that the reaction against the excessive use of the lighter bricks is a perfectly healthy one, that the pendulum is not to swing entirely the other way, that we will be spared the affliction of a town made brick red, and that the wide palette, from which with care and forethought so much can be accomplished, will be superior to any mere whims of fashion.

A PROPOSITION has recently been suggested in this city which certainly deserves earnest thought. The Museum of Fine Arts is situated on a tract of land facing Copley Square, and open on each side. At the time it was built, some twenty years ago, the district had not received its present character, and in fact Copley Square in those days was almost in the suburbs. At present the Museum is faced on one side by buildings of an altogether non-fire-proof character; on the other it has for a near neighbor a recently constructed family hotel, of fire-proof construction, and the buildings of the Institute of Technology, constructed with the so-called slow-burning construction, which, however, did not hinder a fire in them this last summer. Immediately adjoining it towards the southwest is a large district of middle-class dwellings, which would offer slight resistance to a large fire. In the changes incidental to the railroad systems entering the city, it has been necessary to relocate the nearest fire-engine house, and the Museum now finds itself at least partially surrounded by buildings of a questionable fire-proof character and with less readily available help in case of conflagration. It

has been seriously considered whether the Museum should not be removed from its present quarters and rebuilt somewhere in the Park System, where it could be entirely isolated from adjoining structures. The New York fire emphasizes the danger from one's neighbors. A fire in the Museum would result in damages that no insurance policy could begin to make good. The neighbors of the Museum are apt to become more numerous rather than less, and though the building itself is fire-proof in construction, its large skylights and necessarily large openings would make it an easy prey to a conflagration. In view of all these conditions, we feel that the trustees of the Museum are not only justified in considering the removal to a more open location, but that such removal is a duty which they owe to the community and to the invaluable treasures placed under their care. Copley Square is now enriched by the presence of Trinity and the Public Library, the New Old South and the Museum, but it would be far better for the square to lose a portion of its distinctive character than to take any chances of damage, however slight, to the treasures which the Museum contains.

THE LEAGUE COMPETITIONS.

THE activity and continued progress manifested by our architectural societies is one of the encouraging signs of the times. The Architectural League, of New York, worthily keeps up its traditions by the manner in which it is constantly creating opportunities for study and for improvement, and placing such opportunities within the reach of the younger members of the profession. The announcement has been received of the competitions which the League is to hold this year for the awards of the gold and silver medals, the Avery prize of fifty dollars, and the President's prize of the bronze medal and twenty-five dollars. The award of the gold and silver medals and the Avery prize are open to all residents of the United States. The President's prize is open to the members of the Architectural League only. For the gold and silver medals the program contemplates a design for reviewing stands and public grand stands, arches, etc., in the nature of temporary structures required for the purpose of reviewing an army returning from foreign service. The site is assumed to be Riverside Park in the vicinity of Grant's Tomb, which in its present condition is certainly sadly in need of accessories. A reviewing stand of the description provided for in this program would be a most inspiring addition to Riverside Park, and the mere fun of studying out such a problem ought to be enough to call out a great many designs from our younger architects. For the Avery prize a design is required for a war medal for decoration of soldiers in commemoration of Santiago, while the President's prize is to be awarded for the best design for a poster for the League Exhibition of 1899. Full particulars of these competitions can be obtained by addressing Mr. Robert W. Gibson, Chairman of the Committee on Competitions, 215 West 57th Street, New York City.

OWING to Mr. Wheelwright's absence in Europe, paper No. XIV. of the American Schoolhouse Series will not be published until the January issue. There will be at least two more papers in this series, which will be published in consecutive issues following January.

WINDOW JAMB AND CONSOL.
Executed in Terra-Cotta by the New York Architectural Terra-Cotta Company.

PERSONAL, CLUB, AND SUNDRY NEWS ITEMS.

MESSRS. INGLE AND ALMIRALL, architects, announce the removal of their offices, after December 11, from 874 Broadway to 10 and 12 E. 23d Street, New York.

THE MEXICAN CONSTRUCTION AND ENGINEERING COMPANY, City of Mexico, would be glad to receive catalogues and samples of American building materials.

HERBERT E. GATES, architect, 58 Bedford Row, Halifax, Nova Scotia, would be glad to receive catalogues and samples of American building materials.

THE BUILDERS AND TRADERS EXCHANGE, of Columbus, Ohio, request manufacturers' and dealers' catalogues.

ON Monday evening, November 21, Normand S. Patton addressed the members of the Chicago Architectural Club on the subject of "A Typical Public School," especial reference being given to the needs of Chicago schools.

THE annual meeting and dinner of the Beaux Arts Society was held at the Café Flouret, on November 18.

The retiring president, Mr. Walter Cook, addressed the society, speaking of the work of the past year, and in particular of the success of members of the society in the New York Library and California University competitions.

The reports of the secretary, treasurer, and committee on education were accepted, that of the treasurer especially being received with great enthusiasm.

The following officers were elected for the coming year: President, John Galen Howard; Vice-President, Edward L. Tilton; Treasurer, Joseph H. McGuire; Secretary, Charles Butler; Corresponding Secretary, Theo. Evernghim Blake; Members of the Committee on Education, Ernest Flagg, John M. Carrere, and Charles Morris. Cary S. Rodman, Atelier Blondel, Scellier de Gisors, was elected a member of the society.

An invitation was received from the Architectural League to take part in their dinner and meeting of January 3, and it was decided to inform all the members of the society in order that as many as possible might be present.

The meeting concluded with the enthusiastic reception of the six *derniers nouveaux*.

ILLUSTRATED ADVERTISEMENTS.

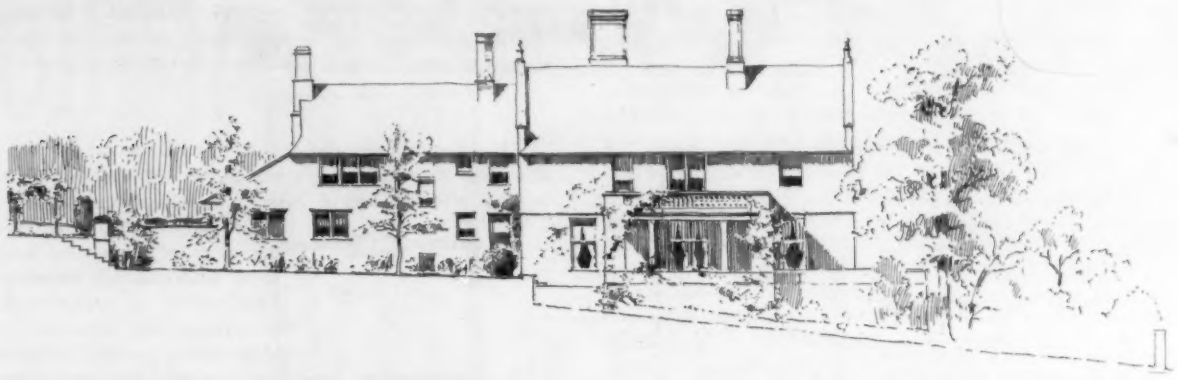
THE following new illustrations may be found in the advertising pages of this number: detail of window, Plymouth Building, Minneapolis, Frederick Kees, architect; advertisement of Fiske, Homes & Co., page x; residence at Buffalo, N. Y., C. D. Swan, architect; advertisement of The Harbison & Walker Company, page xv; the Crozer Building, Philadelphia, Frank Miles Day & Bro., architects; advertisement of Conkling, Armstrong Terra-Cotta Company, page v; Somerset Apartment Hotel, Boston, Arthur H. Bowditch, architect; advertisement of The Celadon Terra-Cotta Company, Limited, page xxvii.

Suburban Residence Built of Brick.

COST, TEN THOUSAND DOLLARS.

BY WALTER COPE.

HOUSES are built to live in and not to look on; therefore, let use be preferred to uniformity, except where both may be had," is a dictum oftener quoted than followed. Whose fault is this? Are we architects responsible? Is it our fault or our misfortune that much of the domestic architecture of the present day fails to express anything very clearly and continually wanders from one



caprice of style to another, until we become well-nigh desperate at this eternal torment of style and detail, this babel of tongues?

The owner usually selects a site for his house before he consults with us, and so begins to crystallize his ideas too soon, seizing often upon what he considers his own particular province, the "practical" part of the problem, and limiting us to what he believes to be the architect's only sphere, the mere embellishing of his scheme. True, he magnanimously credits us with the magical power to make impossible proportions beautiful, and in a general way to bring order out of chaos. So, where he sticks fast, he says: "You as an architect can, of course, work that out. I don't so much care how that part goes, but I must have," etc. Our faces glow with well-feigned admiration, while our hearts sink. He leaves us, having secured the promise of a sketch in the course of a few days. We put on our hats, go out to lunch, come back and throw ourselves defiantly at the problem as we have accepted it, with a conviction that the scheme is hopelessly defective, but must somehow or other be beautified into shape. Is it any wonder, under such conditions, that we allow our whole energy and enthusiasm to be taken up with that part in which "the stranger intermeddleth not"?

But if the result of our efforts is a senseless and wasteful plan whose defects are but partly masked behind a studied arrangement of architectural detail, whose is the fault? It is ours, because we do not try to capture the citadel of the Philistine but content ourselves instead with sallying now and again from our own stronghold, first in one direction and then in another, slashing madly to right and left, to prove to the world that we are the rightful masters. Yes! We are to blame. We are cowards. The Philistines are not so strong as we imagine and can be won by strategy if not by direct attack, and when they are captured and put under tribute they will make very good subjects, and the architectural millennium will then begin.

In the case before us, THE BRICKBUILDER furnishes the lot and the owner keeps entirely in the background. The lot is uncomfortably narrow and slopes quite too violently to make the planning of a house for it a restful or soothing exercise. Besides, it slopes south and west instead of south and east, and this forces me to put my porch on the west side, in the glare of the afternoon sun, since it must not be on the front, and we shall have to wait until the oak trees grow big before it will be right. Sadder still, our garden will not get the early morning sun. Failing to exchange the lot for one I liked better, I would have set the house close to the western side instead of the eastern, with its drawing room, library and dining room all looking out on the porch and garden to the east, but I could not bring my mind to thus give up the distant view over the valley and out into the western sky. Walled gardens are lovely — outdoor rooms, with the sky for a ceiling, and the rest of the world hidden. But I must have this and the distant view, too — both of them — for my library windows.

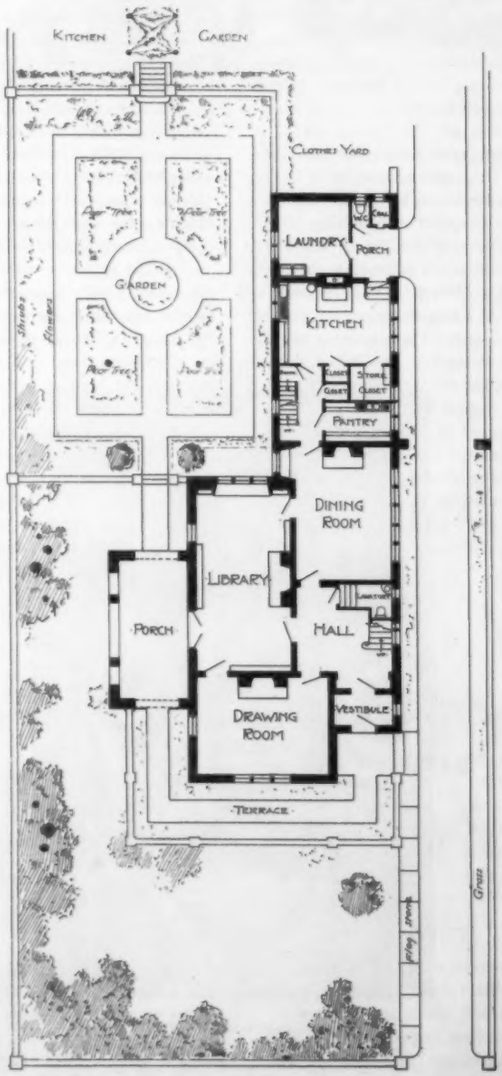
So the house is made as narrow as possible and placed close to the eastern line with a narrow driveway between it and our neighbor up the hill, whom we cut off with a brick wall of goodly height. Ivy will grow well on this wall, for it is mostly against the bank and therefore damp and cool in hot weather. I don't own a horse or carriage, but hope to some day, and in the meanwhile the driveway shall be for the tradesmen and for ourselves when we hire a cab to take us out or to bring us from the station in the rain. When I can afford it I may build a little stable, up at the back of the lot. In plan the house is, in a sense, tumbled together, with "use preferred to uniformity." The entrance is at the southeast corner with the doorway facing the front, though the hall lies on the eastern side of the house. The dining room, of course, is on the east side, too, for every one should start the day with some sunshine at breakfast. And we will have a little peep, too, at the sunset and a breath of sweet air from the garden through the little window in the west corner. The lot is too narrow to waste in a passage from the kitchen to the front door. This never seemed to me a matter of importance because the waitress answers the door bell. A drawing room, I suppose, has to be; first because THE BRICKBUILDER says so, and secondly because in the course of the year many people call to see us who must be received decently, though we have no idea of sharing our library with them. Besides, we may need a drawing room for our daughter's wedding twenty years hence; so we are to have one, and we shall try not to make it altogether a Potter's Field. But I feel it in my bones that we are going to live in the library and that the door between the two will

be surely kept locked, except when we have a party. As for the library, I like a long room if the ceiling is not too high. A number of people can be sociable in such a room in a reasonable and a happy

The laundry is entered only from the outside and is ventilated like the kitchen into the large flue. The clothes yard will be back beside the kitchen garden.

way, because they will not sit in a circle like an Indian council. As to a porch, I cannot abide it on the front, for we want it to ourselves, whether our visitors be peddlers or our dearest friends. Our friends are sure of a welcome, and if they hear our voices on the porch can find us by walking around the terrace without stopping to ring the front-door bell.

The house will have its kitchen wing, for in this climate any arrangement which does not insure air on both sides of the kitchen and pantries, however small they may be, is a mistake. The pantry will not open direct into the dining room, for it is trying for the hostess to keep up the conversation with her guests while she hears her glass and china being smashed at the sink. There is a closet for the brooms and coal-scuttles, and a way for me to get to the cellar without intruding on the cook and her friends; and though the back stairs are bound to carry the smells of the cooking to the second story, we hope to successfully head them off there from the front of the house. The kitchen will have a large ventilator in the ceiling — not in the wall near the ceiling — opening into the flue which encloses the iron smoke pipe of the range, and the tops of the kitchen windows on both sides will be on a level with the ceiling, so that we hope to ventilate the kitchen well and to keep the room over it reasonably cool in summer. There is a closet for the cook, a weak concession to the modern false sense of order; cooks should not be allowed to have closets where they can associate old bonnets and ill-washed pots. The little storeroom is just big enough for a refrigerator and a few shelves but it has its own window to keep it cool. This room we want to line completely with glazed tiles. The cook will not have to drag her coal up from the cellar, for there is a bin on the kitchen porch which will hold a supply of coal for three or four months.



Upstairs we have tried for quiet rooms, cut off as much as possible from the sounds in the hall below; and the second floor will be built with two sets of joists, quite independent of each other: one to carry the first story ceiling and the other for the second floor, with loose deadening felt between them. This method of deadening floors I have found very effective. Several of the closets between the rooms have doors on each side, so that they may be used for either room, as may prove most convenient, or as communicating passages when desired.

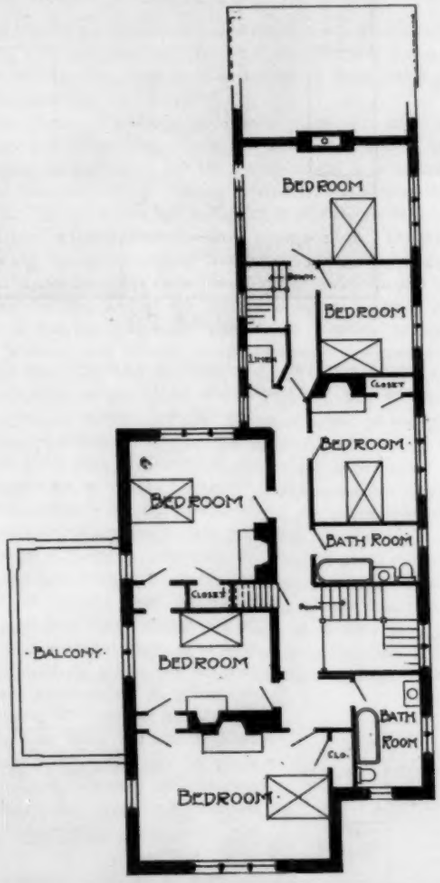
The loft will be reached by a little steep stair and will have nothing but a floor, and while it is not intended for anything but trunks and lumber, I know that it will make the most fascinating of play-rooms for the children on a rainy day, — a fairy world which the "grown-ups" never invade, — full of delightful mysteries, the scene of dark conspiracies, of feasts and tournaments and hair-breadth escapes, of solemn funerals and happy weddings.

But the house is only half of our scheme. It will be as simple and cheap as we can build it substantially. The bricks will be dark red hard brick, selected merely for color and laid Flemish bond with over-burnt headers, the joints about $\frac{5}{16}$ in. wide and raked out deep. What little there is of moulding or coping will be of hand-made bricks like the others, except at the entrance door where we shall waste a little money on a bit of detail in dark red stone. On the street front and on both sides of the lot, running back at least as far as the kitchen garden, we shall have a brick wall coped with bricks on edge.

And on this we shall plant vines — Irish ivy, where it will grow well — and in places jessamine, and climbing roses, and honeysuckle, and virgin's bower. Then there will be some beeches and dogwood, and a lot of

rhododendrons down near the street, and two or three oak trees, and close up near the terrace, a yew. Back near the garden will be more oak trees and a honey locust and a lot of sassafras, and at the garden entrance, two box trees. At the back of the garden, on each side of the steps, there will be lilacs, and along the west side, hawthorn and flowering plums and what-not. The garden will have four pear trees, one in each main bed, as in all good old-fashioned gardens. Our summer sun is too hot, and the feathery shade of the pear trees is welcome to the flowers. Besides, what is more beautiful than a pear tree in bloom?

This is not half of what we shall plant; but why mention each tree or shrub more than the books we intend to have in our library or the pictures on our walls? We have got an old Scotch gardener, and though he does not think much of my garden lay-out and shakes his head ominously at it, I know it is only because he intends



to surprise us next summer with the wonderful results that skill can accomplish under adverse conditions. He declares that the side next the house is hopeless, but I notice that he is devoting much attention to it, and that the florists' and nurserymen's bills are like to ruin me. He has not been in Spain and does not know that ivy-leaf geraniums should be set in pots on a parapet, to tumble over the wall in masses of bloom. But we shall see: he loves flowers, and I cannot help thinking that he takes a pitying interest in me as one who really cares for them too, though full of strange notions about twigs and masses of foliage, and hopelessly ignorant of botany. The kitchen garden shall be his, and if I will not allow coleus in a bed in the front grass, or the garden given over entirely to prize specimens for the flower show, he can do what he likes in his own undisputed domain.

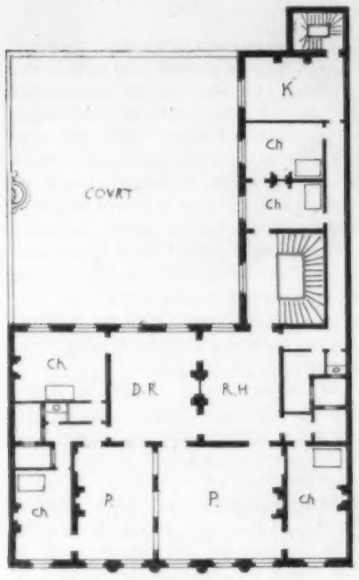
The Architecture of Apartment Buildings. III.

BY IRVING K. POND.

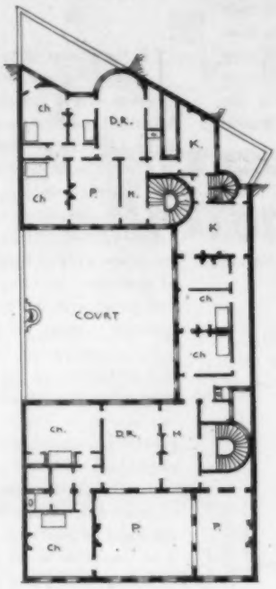
IN the matter of height, to the extreme of which modern buildings of all classes seem to aspire, much of interest is brought to the problem of the apartment building. To what number shall stories be added one upon another? Beyond what height do stairs begin to be a burden to owner and occupant? and what is the lowest limit at which the elevator appears as an income-producing factor? These and kindred questions arise when the matter of height presents itself. An absolutely satisfactory answer to these questions implies a knowledge of all the conditions surrounding the special problem; but a few general lines may be laid down. There are various classes of apartment buildings, and even the term "first class" is relative and varies with the country, the province, or indeed the city. But taking it to mean the highest type yet produced in Paris, for instance, a city of apartments, or in the two or three principal American cities, it is safe to say of the "apartment of the first class," that in these latter cities the elevator can be omitted from no building of above two stories in height, and this brings the investor up against the generally accepted statement, that in no building under five stories in height, and with two apartments served to each story, is the elevator a profitable institution. But profitable or not to the owner, in many localities the elevator is considered an absolute necessity by tenants, and must be operated. Of course, in apartments of the highest type it is desirable so to plan the building that but one apartment is served to each story, yet this makes the matter of the elevator of great moment to the investor, from the points both of original outlay and of the expense of continued operation, and three or four-storied apartment buildings must be extremely well planned and very desirably located to produce above what is expected of an investment, sufficient to cover the interest on the first cost of the plant and maintain the every-day operation of the elevator; so that, as the elevator is a necessary feature in the arrangement of any well-equipped apartment building, it remains to make it not an evil to be endured by the owner alone, but a blessing which will fall with equal beneficence on owner and occupant. Experience has demonstrated that this good effect may be brought about by increasing to the natural limit the number of stories of the building; the natural limit being that imposed by local conditions, the width of contiguous streets or alleys, the size of the building lot, the character of the locality, and so on. There is no limit to the height of even a first-class apartment building, except as determined by these and reasons of structural economy and necessity, for the upper stories are the more to be desired, as they are above the dust, noise, and discomfort of the city pavements, and, where prospects are to be had, command wider views.

The elevator has made possible the high building, which itself was the outgrowth of a demand for the concentration of masses of humanity in desirable or seemingly desirable localities, for business or the purposes of residence. The high building has brought in its train many important problems for solution, and among them is the problem of the court. The court which is capable of such liberal and artistic treatment is now apt to be studied only from the standpoints of the necessity for light (and not too much of that) and for air. The unsightliness and ofttimes unwholesomeness of the back alleys, which are a feature in the geography of American cities, have operated against the use of the rear of the lot to the best advantage, and the street front is about all there is architecturally to an American apartment, or, for that matter, business building. In Paris, as there are no back alleys, each lot and almost each building abuts directly upon its neighbor in the rear. This has led to a systematic development of the court, which is made spacious, and is enclosed by walls on the unbuilt sides, and on one or more sides by the building, with apartments in front, or fore and aft, or on all sides, and in each case the principal stairway is reached from the court, and not directly from the street, insuring privacy, as every visitor to the building or

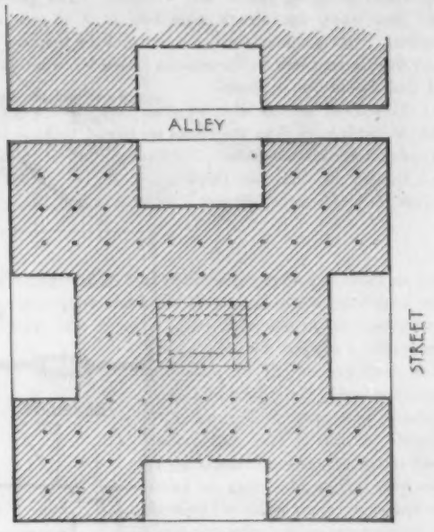
court must pass the *conciergerie*. In all cases the courts receive architectural treatment; in some cases they are embellished with landscape auxiliaries, and in many cases they are made useful beyond



FIGVRE 21



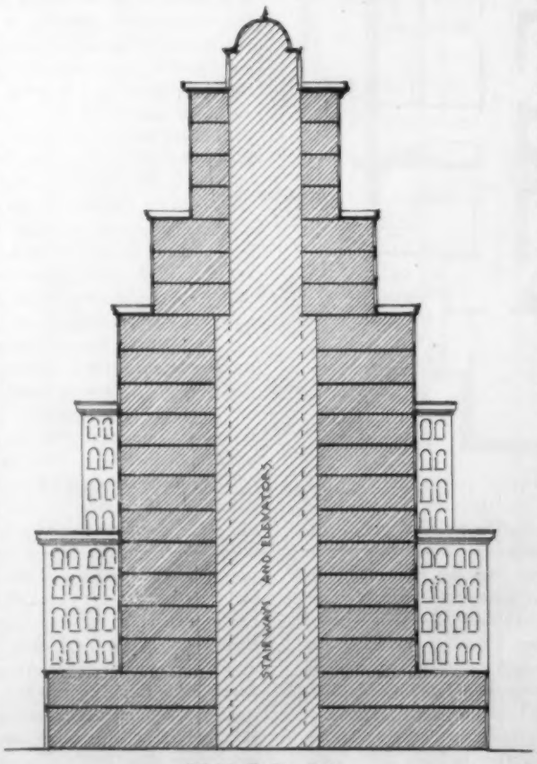
FIGVRE 22



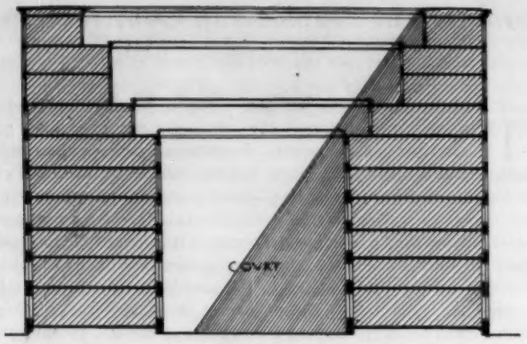
FIGVRE 23

what is apparent on the mere surface; the area underneath the pavement being devoted to the use of cellars, storerooms, and not infrequently horse stalls, thus demonstrating how the French architect economizes the last scrap of space in his building, even as the French cook gives the shreds of last week's turkey or potato paring in to-day's croquette or soup. But the fact, interesting in this connection, is that the court is frequently architecturally the most pleasing portion of the building and forms the most inviting prospect from living rooms and principal chambers. Fig. 21 presents a Parisian type, with one apartment to the story, while Fig. 22 shows the French architect's manner of making desirable the rear apartment in a scheme of apartments fore and aft.

In any proposed scheme for an apartment building in which a court is necessary to the plan (and few apartment buildings are so circumstanced that courts are needless or are merely incidental), in the matter of the arrangement of rooms in any one apartment, and of the relation of apartments to each other, the ground area of the court must be studied in conjunction with and made dependent on the number and height of the stories. For it goes without saying that a court or area which would be sufficiently light and airy for a building of one or two low stories, would be entirely inadequate to its purposes in a structure in which the stories are piled up to the number of six or ten or twenty, growing more and more inadequate as the number increases; so that which a superficial glance at a ground plan may seem to reveal as wasted space in the court, in the ultimate analysis of the case may transpire to be of highest economy, commercial and otherwise; and conversely, many a building has failed as an investment, because while the plan seemed to present an economical arrangement in the finished building, the court was totally inadequate to its purposes. There can be no hard and fast rules regulating the ratio which shall exist between the height of surrounding walls and the ground area of a court, for the special situation and the nature of the chambers depending on the court all count as determining factors. To get air and sunlight into the lower stories of a group of high buildings situated on not over-wide streets is a serious problem, and the high building surrounding a court presents the same difficulties. Attempt has been made by designers of high skill, along the lines suggested in Fig. 23, plan, and Fig. 24, section, and applied in more or less modified form to office building construction with practical results. In such a scheme the streets and alleys receive the benefit of direct sunlight, which is in itself an admirable and much to be desired attainment. The same scheme as applied to an enclosed court is noted in Fig. 25. In the arrangement of stairs and elevators the scheme of Fig. 24 permits of the centralization which is required in a building designed for



FIGVRE 24

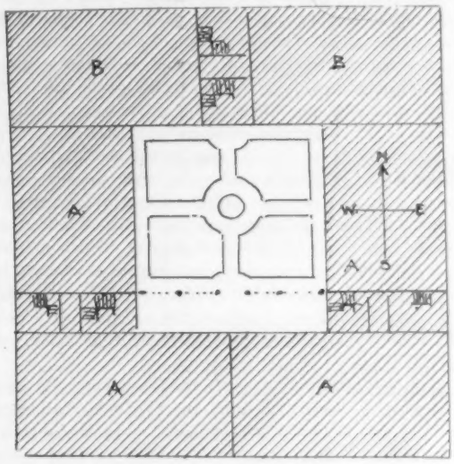


FIGVRE 25

office uses, while a plan such as would result in the section indicated in Fig. 25 would admit of and require widely separated stairway and elevator arrangement, such as is demanded in large buildings with numerous apartments to the story.

This scheme of offset walls is more practical in an office than in an apartment building, where for sake of economy in plan and internal arrangements one story must repeat in a measure the principal features of the one below. However, a modification is presented in Fig. 26 in plan, and in Fig. 27 in section, which is interesting and may be found to contain much of suggestion. The mansards of Paris and the storied roofs of Nuremberg, adding their suggestiveness to a knowledge of the varied conditions of social life of a Berliner apartment building and of the communal life of a family hotel in Europe or America, but more especially in America, are reflected in the scheme, and present an arrangement designed to meet the requirements of two special and distinct phases of apartment life not heretofore mentioned. For Figs. 26 and 27 are introduced not alone to indicate how the introduction of sunlight may be effected, but also to suggest the possibility of catering to that variety which is essential to the comfort and convenience of the higher social life of to-day. A study of apartment buildings would not be complete if it did not recognize the necessities of those who are painfully self-conscious in the public glare of the hotel and desire the privacy of family life, yet wish also to avoid the cares and responsibilities coincident with the direction of a large corps of servants, and therefore wish to reduce the culinary department to a minimum. Apartments for such as these, in all their appointments, follow types already described, except as to kitchen, which is small, but so efficiently equipped that the household shall not at all times and under all conditions be dependent on the public restaurant. In a building containing apartments of this type a public restaurant must be maintained, and a general laundry is desirable.

Nor would a study of apartment buildings have fulfilled its purpose if it were to take no notice of the requirements of a large and rapidly growing constituency known as "bachelors," and of another smaller though important section known in fiction as "bachelor maids." Entire buildings are devoted to the accommodation of these members of the bodies politic and social, and these buildings generally are equipped with a restaurant more or less public in its nature. It seems highly desirable to combine bachelor apartments in the scheme with apartments for those who desire to depend for the most part on the public dining service. Such combination does



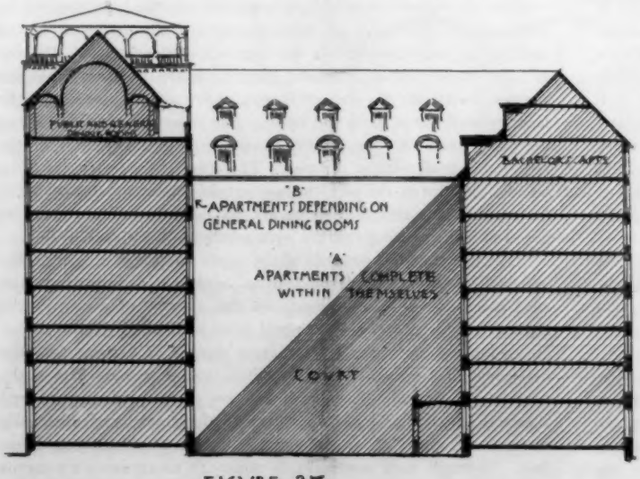
FIGVRE 26

not tend to isolate the bachelor, but to bring him in closer contact with society and make him more of a factor in the life of civilization. The smallest suite for a bachelor should consist of a sitting room and bed alcove or a connected bedroom and a toilet room with basin, bath, and closet. A practicable fireplace in the sitting room is almost as much of a necessity as the room itself for the companionship and the air of comfortable homelikeness it affords.

Probably the best location for the dining room or café connected with an apartment building is in the topmost story, and so situated as to command the best views without, for while it is desirable to have the attention centered about the board, in a public dining room this is almost impossible, and attractive exterior vistas, together with pleasing interior decorations, serve to occupy thoughts and speech to the exclusion of neighbors. Smaller rooms for private service will be found desirable in connection with the apartment café. The roof café, decorated with potted plants along the lines of the palm garden, is gaining favor and will become a feature of public dining service. In all cases enclosed corridors and elevators must connect the general or public dining room with each and every apartment depending on it. The kitchen of the public café must be isolated and thoroughly ventilated, for kitchen odors are obnoxious in apartments and persist if once introduced.

A possibility of combining these various elements of public and private service and of lesser and more extended accommodation is sought to be suggested in the section presented in Fig. 27.

Another glance at this same figure with special reference to the shadow line will help to an appreciation of some of the problems of court embellishment. The ground of the court



FIGVRE 27

may be treated in one of three manners or in a combination of these. First, the court may be paved with a desirable material, such as marble, brick, or concrete, or these used in combination, and made to be effective viewed from above by the pattern and form and color of the integral parts, or it may be treated as an artificial garden, or again as a natural garden. A court pave which is continually drenched in shadow must be treated as a pave alone. If at some time during the day sunlight touches it, the pave may be embellished in an entirely artificial manner with plants in pots and shrubs and trees in boxes. That this treatment may be charming to a high degree is evidenced in the courts of Old-World hotels, and in the palm gardens of American cities.

A court, however, to be treated as a natural garden, that is, a garden in which is greensward and flowering plants and shrubs in beds, must be bathed in sunshine during a greater portion of the day. Natural gardens, to be entirely harmonious and artistically effective, must be laid out and developed in a formal manner when they come in close conjunction with apartment buildings, for the apartment building is necessarily one which should present a graciously formal front to the world. Courts, to be of sufficient size to admit of this treatment, may not be possible in the older and more completely occupied portions of the great cities, but struggle should be made to procure them in the newer and as yet undeveloped quarters, where the architect and landscapist may have free sway. The ideal scheme to be sought even in the neighborhood of great parks is to have convenient and homelike apartments in buildings of reasonable height, surrounding a cultivated court or garden on which the apartments shall face, gaining thus quiet and privacy and insuring a beautiful prospect, which shall continue undisturbed by neighboring building operations.

If any one accessory of court embellishment is to be given special mention, it must be the fountain, which beyond all else is the most musical, poetical, and vivifying feature of landscape treatment. Whether the court be artificial or natural in its handling or whether it be barren of all other decorative objects, the fountain gives an atmosphere of life and animation. However, it is not the function of this article to enlarge on the possibilities of court treatment beyond that already suggested, which is, in fine, that the ample court has a commercial value and may have an artistic value as well, and should be developed to the full extent of its architectural and decorative capabilities.

As it has been the purpose of these articles to bring to notice such matters of general scheme and detail as appertain particularly to apartment buildings, such other matters as all buildings have in common, as systems of plumbing or of heating or of construction of walls, and floor systems, have been disregarded ; nor is it needful to discuss them here, for they are part of the general knowledge of building, requiring, however, considerable care and foresight, not to say insight in the application. And, too, as to the architectural style which shall be adopted for the treatment of apartment buildings, little need be said. Greatly to be desired is a dignified yet domestic feeling, quietly handled in any style which is real style and which may prevail at the time and in the locality. When ideals of domesticity and home life change, style will change and no amount of argumentation will alter the course. The only suggestion that a lover of sincere style can offer is that at all times a simple scheme be made the base of the design both in plan and elevation, and to this as much of elaboration and beautiful decoration be applied as may be deemed desirable, but that no complexity of scheme be offered as a reason for its adoption. In apartments as in life complexity of purpose palls ; simplicity gains with age and knowledge.

THE principle which artists now have mainly to contend for is that of *truth ;* forgotten, trodden under foot, despised if not hated for ages, this must be their watchword. If they be architects, let them remember how vitally necessary truthfulness in construction, in design, and in decoration is to any permanent success in even the smallest of their works. — *Street.*

Important Problems in Construction.

FOUNDATIONS.

BY WILLIAM W. CREHORE, ASSOC. M. AM. SOC. C. E.

THE less plastic or spongy the soil is, the more weight it will carry per unit of surface. Sometimes the ground has to be excavated to a considerable depth before a sufficiently stable soil can be found. In designing for heavy loads it is always best to investigate beforehand by sinking test holes or by making careful borings, because without the knowledge thus obtained it is impossible to decide upon the most economical method of procedure or to design a foundation that shall be best adapted to the conditions of the case. In making borings it is not sufficient to have ascertained the depth of the hard-pan below the surface, but samples of the soil taken at frequent intervals — every two or three feet if the material is changeable — should be preserved for reference. Nor unless they all yield exactly the same result is it sufficient to make two or three such examinations do for the whole building ; but a separate investigation should be made for each footing in order to determine with any degree of precision the best method of executing the work. Furthermore, it is important to continue the borings far enough to find out the thickness of the hard-pan upon which it is proposed to rest; for if it should prove to be only a crust 3 or 4 ft. thick overlying quicksand or other dangerous material, it would be unwise to impose upon it as great a load as if it were 10 or 12 ft. thick.

When upon investigation it is found necessary to go several feet below the proposed cellar floor level in order to obtain a suitable bearing stratum, it will be cheaper and better to design the footings as isolated piers, each of such section as would be determined by the distribution of its load on the bearing stratum (gravel, hard-pan, rock, or whatever it may be) with the proper allowance per unit of area. These piers can be placed well within the limits of the property and the imposed loads brought to them if necessary by means of a system of girders (see Fig. 1); or, being on the property line, may receive the wall load through a system of brick arches (see Fig. 2). If rock is found at a reasonable depth, a more satisfactory result will be obtained by sinking all piers to rock even though a good hard, bearing stratum be found a few feet above it. One reason for this is that a very much larger load per unit of area may be imposed on the rock than on the hard-pan or gravel, and thus the extra expense required to cover the greater area is avoided, and the pier may be built of uniform section from the bottom up. The piers may be built of brick, masonry, or good Portland cement concrete. In excavating for them it is necessary to drive sheet piling in the form of a square or rectangular box, or else to sink a steel cylinder or bottomless box, called a "caisson," the necessity for the latter method depending upon the depth of the hard-pan and the character of the material to be excavated. In this box, when driven or sunk, the pier is built. Good Portland cement concrete is the best and cheapest material to use for the pier, as it may be lowered in place with the least expenditure of time and labor. As caissons have to be driven vertically, each must necessarily have a cross section equal to the required bearing area of the pier. Therefore, if the bearing is to be on rock the size of the pier, the amount of the excavation and the labor required to sink the caisson are all much less than would be required if the bearing stratum were anything except rock.

As just stated, it depends on the depth and the character of the material to be excavated whether to drive sheet piling or to use steel caissons. It also depends on the amount of water in the ground. Alluvial soils or quicksand filled with water cannot be excavated below the water level without danger of drawing into the hole some of the material outside of it, and thus undermining the neighboring ground. Even with the best of tongued and grooved sheet piling quicksand will flow through the cracks and eventually cause a "cave-in" when the excavation has proceeded but a few feet. Through such material it is necessary to excavate by means of a steel caisson tightly riveted and jointed. The cutting edge must

be kept well down below the level of the excavation to prevent any back-flow of the material. It will require heavy weighting with pig iron or old rails to accomplish this, and the bulk of this weight should be piled on shelves inside the caisson as near the cutting edge as possible, without interfering with the men in their work. This will keep the center of gravity low, and thus assist in preventing the caisson from getting out of plumb as it goes down.

With a large amount of water in the ground the work of pumping increases very rapidly as the excavation goes deeper, for the water has to be kept out so that the men can work. When the caisson reaches bottom or the highest point of rock and cannot be driven down any further, the excavation is continued by driving narrow tongued and grooved yellow pine sheeting all around the inside edge (see Fig. 3). This sheeting, or "lagging," as it is called, accommodates itself to the unevenness of the rock, and when down tight all around, the rock can be thoroughly cleansed before the first concrete is thrown in. If the rock lies on a slope too great for a secure bearing and contains no unevenness in its surface into which concrete may settle and form prongs for anchoring the bottom of the pier, it may be necessary to drill a few holes and set iron anchors into the rock, allowing them to stand up an equal distance in the pier, or to dress off the rock in a series of level steps. If the pier is to rest on hard-pan or gravel instead of rock, no lagging is needed. The cutting edge of the caisson should be sunk well into the hard stratum and the bottom of the hole leveled off ready for the concrete. In holes where the water runs in rapidly it is necessary to work fast towards the end. Concrete should be mixed dry in large quantities, and as soon as the bottom of the hole is prepared, the pumps should be withdrawn and the concrete lowered in as quickly as possible, so as to keep ahead of the water, which will at once begin to accumulate.

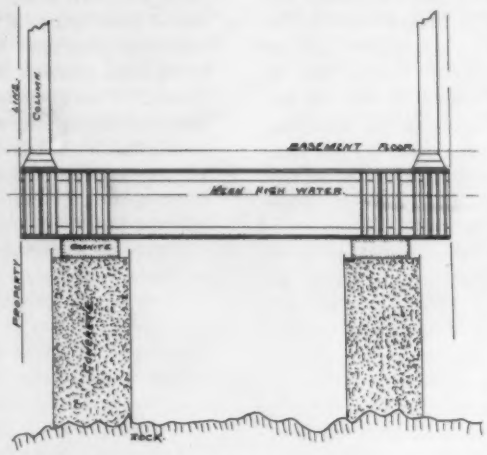


FIG. 1.

When the depth to rock or hard-pan warrants the expenditure, caissons should be sunk by the pneumatic or compressed air process. By this method most of the risks and inconveniences incident to the open caisson method are eliminated or reduced to a minimum. No pumping is required, because the air pressure in the caisson keeps the water back, and if water cannot run in, of course sand cannot either. Then, too, the rock may be thoroughly cleaned off without the use of lagging, no matter how rough or uneven it may be. But it costs money to use compressed air, and the work has to be continued both by night and by day to obtain the greatest economy out of the plant. It is, therefore, an open question how deep the excavation must be to make it profitable to use the pneumatic method. This again depends on the nature of the ground to be excavated and the amount of water in it, because the open caisson work can be carried successfully much deeper in dry soil than in wet. Probably it is safe to say that in alluvial or sandy soil containing much water the open caisson method should not be used further than twenty or twenty-five feet below the ground level.[1] In less dangerous soil it might be used to thirty feet. Beyond this depth, however, it is wiser to estimate on the compressed air method at the outset.

[1] By "ground level" is meant the level of the general excavation or the cellar bottom, which is usually twelve to fourteen feet below the street surface.

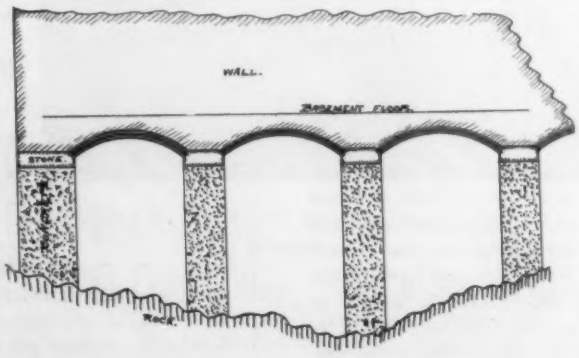


FIG. 2.

Reference has already been made in this paper to the fact that the capacity of any bearing stratum depends, among other things, upon its thickness. The angle of repose of any material is the greatest angle at which the material will remain heaped or piled up without sliding. This angle is measured between an element of the sloping surface and the horizontal. As generally calculated, the bearing power of any material is a function of its angle of repose, its density, and its depth or the thickness of the stratum. These last two properties affect the bearing capacity in a direct ratio; that is, if the stratum were twice as thick it would bear twice as much, or if the material in it were twice as dense it would bear twice as much. It is also true that of two kinds of material the one having a greater angle of repose will bear more weight than the other, but not proportionately more.

Another style of foundation very often used where isolated loads have to be taken care of is a pile foundation. Piles are driven in clumps as close together as practicable, but not so close that the last four or five in the clump cannot be driven as far as the first four or five. Of course, the profitableness of pile foundations depends largely upon the kind of material through which the piles have to be driven, and how long they must be to obtain a secure bearing. Then, too, piles cannot be used except in water-bearing soil, and it should be pretty certainly ascertained that the water level will continue to be permanent. This is a somewhat difficult point to determine unless the location is near some body of water which remains at a more or less permanent level. It is then a simple matter to cut off the piles below the lowest water level and start the masonry or concrete at this point. But without some assurance as to the permanency of the water level it is imprudent to use pile foundations. Surface water or surface drainage changes with the different seasons of the year very materially, and the water level in the ground is apt to rise and fall many feet in a short period of time. This action is very injurious to piles or timber of any kind; in a very short time timber under such action will disintegrate and decay, and, of course, piles so injured could not be depended upon to carry weight. This is the chief objection to using piles for foundation work under heavy loads.

Piles should be driven until their points enter the hard-pan three or four feet, especially if the intermediate material is alluvial or spongy soil. In such soil, and in quicksand or other material containing large quantities of water, there is always more . less motion way below the surface of the ground, owing to the variations in pressure from near-by or distant causes. Consequently, piles whose points were not firmly fixed in a hard, immovable stratum would be liable to dislocation from outside forces in the ground. It is thought by some very advantageous to use piles in material of this nature where the underlying stratum is rock, driving the piles down until the points are battered against the rock; but such a method is not to be depended upon. It may work all right and it may not. If the rock presents a sloping surface and the material above it is of the nature just described, liable to motion at times, there is danger that the feet of the piles may slide down the surface of the rock and thus lose their bearing, and even if the rock presented a fairly level surface and the

piles stood squarely on it, there would be some danger that the motion in the material through which the piles passed might displace them or throw their heads (and consequently the foundation itself) out of line. These remarks apply more particularly to short piles, or to localities where the rock is not very far below the surface. Of course, the deeper the rock is, the more material there is above it to hold the pile in position, and therefore the less liability there is that any dislocation will occur. Another objection to driving piles to rock bottom is, that the last few blows of the pile-driver are apt to break the pile some distance from the point, anywhere in fact where the pile is weak. It requires very careful driving to avoid this; the material through which the pile is driven being soft and spongy, when the point strikes the rock the sudden change is so great that it may not be discerned quickly enough by the operator.

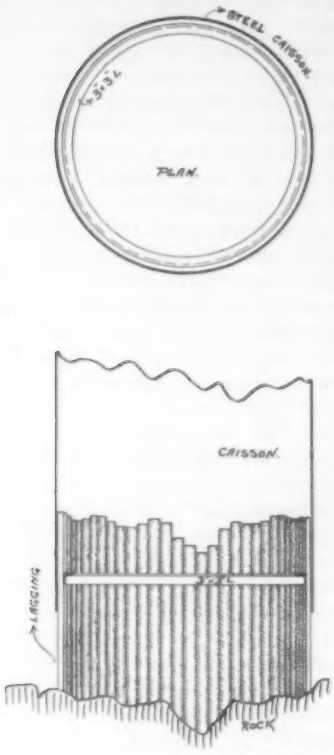


FIG. 3. SECTIONAL ELEVATION.

The usual way of starting the foundation on top of piles is to cut them off at a given level and fill in a solid concrete bed 2 or 3 ft. thick down to a point 18 ins. or 2 ft. below the heads of the piles. On this bed of concrete the masonry is started, or if it is to carry a column it may be covered by grillage beams properly spread over its surface to distribute the load of the column. The amount of load which may be safely imposed upon each pile is in some cities regulated by law, but such a regulation, of course, restricts all cases to the conditions of the worst. Localities differ so much that it is not probable that any two sets of pile foundations constructed in the same manner possess the same efficiency, but it is safe to form a definite conclusion as to the bearing capacity of a pile from its action under the hammer. The usual rule is: —

$$\text{safe load} = \frac{2wh}{S+1} = \frac{2 \times \text{weight of hammer} \times \text{hammer's fall in feet}}{\text{set under last blow in inches} + 1.}$$

There is this objection to the use of any such rule which has to be applied during the progress of the work: namely, that it is not possible to decide in advance just how many piles will be needed and therefore to design the footings with reference to this; but in most cases there is some circumstance from which one may form a fairly correct judgment in advance, and thus approximate the number of piles necessary under each footing. It may be done, for instance, by observing the results of other work in the neighborhood or by comparing samples of the soil with other soil in which piles have been driven. If deemed necessary, a few test piles might be driven to determine the allowance of weight for each. Specifications usually require piles to be driven with a hammer of given weight, falling a given height, until the set under the last blow does not exceed a given specified amount, which has been determined by an application of the foregoing formula for safe load. This works very well where there is a sufficient stratum of hard-pan to receive the points of the piles and embed them properly; but if, as is often the case, the hard-pan is only a thin crust overlying something softer, it then requires considerable skill to stop the pile just at the right point in its downward course, and more often, just as it is thought to be properly set, the last blow will send it crashing through the hard-pan in open defiance of the specification. This only emphasizes the necessity for making preliminary borings or soundings in the case of pile foundations as well as for other kinds.

A very much better although more expensive way of building a foundation in localities where the rock is not far below the surface is to use pipe piles filled solidly with concrete. These pipes, 8 to 12 ins. in diameter, are driven by steady pressure and with water jet, being made up in short lengths, say 4 to 6 ft. each, with the customary pipe fittings on each piece. They are screwed together as wanted, and forced down to a solid bearing on the rock. These pipes, obviously, bear very much more weight than it is safe to allow on wooden piles of the same diameter, and consequently they need not be spaced as closely. When down to solid rock, the bottom should be cleaned off and Portland cement concrete filled in to the top. The heads of these piles should be embedded in a solid bed of concrete similar to the one described, the depth of this bed depending upon the average distance of the piles from each other, so that the farther apart the piles are the thicker the bed should be.

This latter method of footings is an ideal way of underpinning or shoring buildings adjoining which there is to be deep excavation or heavy foundation work (see Fig. 4). Pipe piles may be sunk one at a time and driven down by the use of jacks under the building's own weight. Their distance apart is regulated by the load to be carried, and they should be so placed as to receive this load most advantageously. Such supports as these form the most secure underpinning for a building resting upon more or less spongy or water-bearing soil, which is liable to be drawn away by the operations of the work adjoining. More especially is this true if there is a large underlying stratum of quicksand. Very many buildings are resting upon quicksand, either immediately on or a few feet above it, and in fact such a stratum is perfectly secure and stable so long as it is allowed to remain undisturbed; but as soon as the pressure in the neighborhood is relieved at any point, the quicksand ceases to be confined and moves in the line of least resistance, thereby undermining the actual material upon which the building rests or perhaps the building itself. It is therefore exceedingly necessary to provide carefully for the security of weights or buildings resting upon soil of this nature before any of the pressure in the neighborhood is relieved. In comparison with other methods of shoring buildings which rest upon uncertain soil, the method of pipe-piling is far superior to any. In any system of spur-shoring or needling, the building's weight is merely transferred from one point to another on the same surface, and unless the feet of the shores are resting on stable material, there is just the same danger in undermining them as in undermining the building without them. In fact, to hold a building securely against damage, it must be underpinned to something solid and stable enough to carry its weight without yielding, and furthermore, the underpinning must go down at least as deep as any excavations in the immediate vicinity are to be carried. This can be done thoroughly well and with comparatively little expense by the method of pipe-piling, or "stilts," as it is occasionally called.

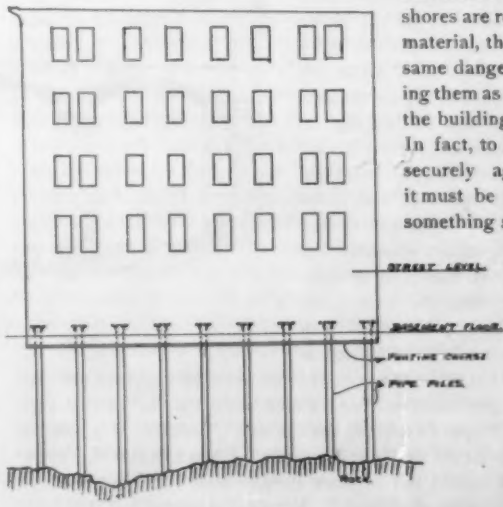


FIG. 4.

A SEVENTEEN-STORY BUILDING TESTED BY FIRE.

THE most crucial test to which a building of typical modern construction has yet been subjected occurred in New York City, a little before midnight, on the 4th inst. A fire originated in the basement of an old-style erection of five stories, stocked with inflammable merchandise. This building stood on the southwest corner of a block, and the fire reached its height during the progress of a wind storm blowing from the northeast. This fiery ordeal was therefore a conclusive one, in point of severity and duration. The facts obtained and observations made by the writer at the scene of this fire on the 5th and again on the 6th inst. suggest a number of important considerations, and will be found to bear out the following deductions:—

First. The fire did not originate in the modern building, but in a structure which had been erected long before the era of fire-proof building. The former had little to fear from fire on its own account, and should one have occurred on any of its floors, there is little doubt but it would have been extinguished by means of the appliances at hand. Certainly it would have been localized, and subdued without serious damage to other parts of the building. The origin, as well as the extent, of the disaster is therefore due, not to the height of the building, or to defects in its construction, but to the proximity of an undesirable and, as it proved, dangerous neighbor.

Second. The omission of iron shutters from the north wall and around the light shaft of the Home Life Building was undoubtedly the secondary cause of the extensive damage which that building sustained. With flames towering up from the seething mass of five stories below, and driven by a fierce wind against twelve stories of plate glass and window sashes, it was, of course, but a question of minutes before they would gain admission to the interior. These windows giving way simultaneously, tongues of flame reached the furniture, fittings, loose papers, and other combustible contents on every one of these floors. The modern building had then to withstand twelve distinct fires of its own, all of which were fed from the sheet of solid flame in which it was enveloped on the outside. Had the window openings been furnished with close-fitting shutters of sheet iron, leaving an air space equal to the depth of the reveals, we doubt whether the flames would have penetrated into any portion of the interior. Doubtless there would have been broken glass, scorched woodwork, and other evidences of a fire that had been held at bay; but the immunity from flame on these twelve floors would have enabled a detail of firemen to remain on each of them, playing water on the inside of the iron window shutters, until the fire in the old building had been exhausted.

HOME LIFE INSURANCE BUILDING, NEW YORK CITY.
Burned Dec. 4, 1898.

Third. Had the Broadway frontage been less pretentious, it would have been more enduring, even when attacked by fire. A free adaptation of French Renaissance detail, carved in the choicest marble, was indeed a thing of beauty — before the fire had calcined the carbonate of lime, and water had reduced it to a hydrate. Our photograph, taken on the day following the fire, gives an idea of the extent to which every projecting member had already suffered. At that time but little water had reached the upper stories, and the utter destruction of the marble will therefore not become apparent until after it has lost all cohesion ("slacked"), which it will do by the immediate action of successive rains, alternating with approaching frost. If allowed to stand untouched, very little of the marble in the upper stories would sustain its own weight during the four months next ensuing.

Fourth. A frontage of terra-cotta and brick walling that had already passed through a white heat in the kiln would have defied the action of the flames, besides affording a corresponding degree of increased protection to the structural steel. We have no hesitation in saying that had these materials been used instead of the more expensive marble, it would have required but a good cleaning down with soap and water to render the Home Life Building the abiding home of its owners. As it is, the apparently casual use of burned clay in the form of tile, hip-roll, and ridge cresting has alone enabled them to retain a roof over their heads. Not a particle of this red roofing tile has suffered, in which respect it stands out in uncompromising contrast with its surroundings.

Fifth. The steel frame remains erect, having stood this remarkable test in a way to dispel doubts as to its efficiency, instead of giving cause for alarm in relation to skeleton construction generally. This fire, so far from being "the death knell of the sky-scraper," has furnished a striking, if not a conclusive, vindication of its safety under the most trying conditions. The superintendent of the building department does not overstate the case in saying that "the firemen would have been blowing up buildings away down below the Astor House in an effort to stop the progress of a conflagration, had there not been such a bulwark interposed between the flames and the blocks below." Our own opinion is, that had the block bounded by Broadway, Murray, Church, and Warren Streets been composed of five-story buildings, such as the one in which the fire took hold, none of them could have escaped destruction. This, we think, will be considered a very conservative estimate, when we recall what happened in Boston, Chicago, etc., during the present generation.

Sixth. With the two fundamental exceptions to which attention has been directed, this building proved that there *is* such a thing as fire-proof construction. It has likewise accentuated a number of things liable to be overlooked or underestimated by architects, in settling the details and selecting the materials to be used in buildings of the class to which it belongs. In the present instance, we have noted what seems to us the two fatal weaknesses to which is due nearly all the damage that has befallen an otherwise successful scheme of construction. With the Broadway frontage executed in architectural terra-cotta, and the rear windows adequately protected, the Home Life Building could have been made equally beautiful and at the same time invulnerable. Now that the upper half of the frontage overlooking this famous thoroughfare will probably be rebuilt, we venture to offer these belated reminders on the principle that capable men can afford to admit their mistakes, and wise men always hasten to correct them.

T. CUSACK.

REPORT ON HOME LIFE BUILDING FIRE, NEW YORK, DEC. 4, 1898.

BY CHARLES J. EVERETT, JR.

CONTRARY to popular opinion, the recent fire in Rogers, Peet & Co.'s large clothing store, and in the adjoining "sky-scraper," furnishes evidence of the efficiency of progressive fire-proof construction, notwithstanding the fact that in some respects the building was not the most advanced type of modern fire-resisting structure, as will be pointed out further on. A change of plan by the owner, doubling the width of the building after reaching the sixth story, rendered necessary certain modifications of detail, and increased the burden of the architects, who are rarely free agents in such matters.

The block on Broadway, between Warren and Murray Streets, was occupied by three buildings, namely, Rogers, Peet & Co.'s five-story store on one corner, the fourteen-story Postal Telegraph Building on the other corner, and the Home Life Insurance Company's building filling the space between. The Home Life Building is a steel frame structure of fifteen stories, surmounted by a tall, wedge-

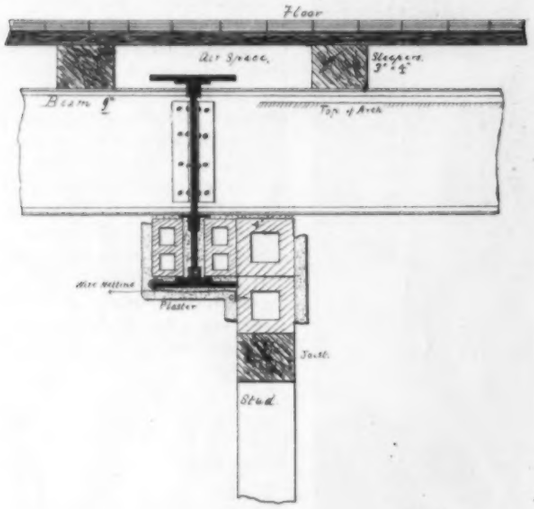


FIG. 1.

shaped tower, and was erected in 1894, from designs of Messrs. N. Le Brun & Sons, architects.

On the night of December 4, at about ten o'clock, fire started in the first story of the store of Rogers, Peet & Co., during a furious northeast gale, which at times reached a velocity of over sixty miles an hour. The flames soon broke through the roof of the building, and were driven by the strong winds against the lofty walls of the Insurance Company's building, rushing up the light shaft, which formed an excellent chimney extending 150 ft. above the roof of the clothing store. Two sides of this light shaft consist almost entirely of window openings unprotected by iron shutters, and the third or rear side shows two windows to each floor, likewise unprotected. The main wall of the building on the same north side also contained two windows at each story, without shutters. The flames from the clothing store, beating against all these windows, shivered the glass, ignited the sashes and frames, and urged by the strong gale, soon filled every story of the taller building above the seventh floor with a mass of fire. This assault from the outside made it impossible for the firemen to fight the flames within the Insurance Building until the clothing store was entirely consumed.

The floor construction of the Home Life's building was 9 in. beams in the front portion and 12 in. beams in the rear, spaced about 4 ft. 6 ins. apart, and 9 in. hard tile terra-cotta side-construction arches between beams. The lower flanges of beams were pro-

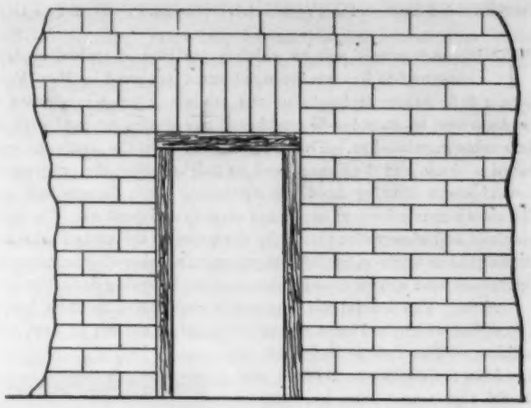


FIG. 2.

tected by skew-backs with protecting lips. The floors were of two thicknesses of ⅞ in. boards nailed every 16 ins. to 3 by 4 in. sleepers laid on beams. Little or no concrete was used over arches, thus leaving a free air space of about 4 ins. in front and 7 ins. in rear, between the top of arches and the wood flooring. The absence of concrete filling over arches left the upper flanges of beams exposed for, say, 1 in. and those of girders for 2 ins. in front portion of building, and still more in rear. While none of these exposed flanges appear to have been injured by fire, except on the fifteenth floor, they escaped only by reason of the limited height of exposed metal, as demonstrated by results on fifteenth floor, mentioned further on. Over a large part of the building above the seventh story the flooring and sleepers were entirely consumed. This air space beneath the floors insures the destruction of all combustible floor material. It should be entirely filled with incombustible matter.

The partitions were of 4 in. porous terra-cotta tile, and the column covering and furring was of same material 2 ins. thick. The partitions rested directly on the arches, or on a ridge of concrete brought to a level with the top of beams, so that there were no fire-runs under the partitions, as has been stated by some critics. The hall partitions, as is usual, did not extend to the ceiling, windows with wooden frames filling the upper 3 ft. or so. The columns were

FIG. 3.

FIG. 4.

covered with 2 in. porous tile blocks ribbed at backs to allow a partial air space. The lower flanges of important girders which projected below ceilings were covered with wire netting and plaster, or mortar, rather.

As the building was practically gutted from the eighth floor to the roof, it is unnecessary to describe the condition of each floor after the fire.

In many of the rooms the fire consumed everything combustible, including all door and window frames and casings, all floors and sleepers. The heat was strong enough to warp and twist ironwork, such as steam and water pipes, typewriters, etc., and in one room the brass of a light bracket was melted; yet the terra-cotta arches (of hard tile), the furring and column covering (of porous tile) were uninjured, and with a very few exceptions, the floor arches are in such condition as to require little or no repair. The first exceptions are where safes resting on floors between beams were dropped a distance of several inches, through the free air space just condemned, on to the tile arches, by the burning away of the flooring. In one instance a safe weighing about two tons fell through the tenth floor into the office of the Rapid Transit Commission on the ninth floor and there stopped. The tile arch directly under the falling safe was knocked out, but the double wooden floor, and the fact that one edge of the safe struck the side of a girder, stopped further descent. The second exception occurs in the rooms on the fifteenth floor, on west side of light shaft, where an entire panel of arch has fallen, and the remaining arches between it and the stairs are bellied so as to necessitate removal. The 12 in. beams of this section are found to be sagged. The failure of these beams can only be due to the heating of the upper portions, which were exposed for a height of 4 ins. above the arches, as the lower flanges of some of them are still well protected by the tile. Some other arches appear to be slightly bellied, and in some places the lower webs of single blocks are cracked off; but the condition of the arches, taken as a whole,

FIG. 5.

FIG. 6.

indicates a splendid resisting power and adequate protection of metal from a very hot and prolonged fire.

This fire warns us against the use of wire netting and plaster for protecting beams in the manner here applied. (See Fig. 1.)

The webs of all girders were well protected underneath by tile blocks supported by lower girder flanges, but the girder flanges depended for protection upon wire netting bent around them and then plastered. Where the wire netting was thus bent around both sides of flanges it held itself in position, but in some cases the netting was nailed on one side to the porous partition blocks, as shown in Fig. 1. In the hall partitions the upper blocks were supported by the wooden framing of the partition windows, and, of course, fell when this framing was burned, and pulled down with them the protecting plaster coat, exposing the girder to the fire. This, however, could hardly have occurred until after the fire had begun to subside, since the girders show no marks of injury; but had the fire continued after the netting fell, some of the main girders must have failed by reason of their lower flanges being exposed for a length of 10 ft. or more.

In general, where the fire played strongly against plastering it fell off from walls and ceiling, and the plaster on the under side of the wire netting likewise dropped off, leaving only that portion which was pressed through on the upper side of the netting to protect the metal framing. In some instances the netting hugged the metal so

FIG. 7.

closely at some points that there was no room for protective plaster on the inner side, and practically left the metal without protection.

Wherever this method of fire protection is adopted, a space of at least 1 in. should always be preserved between the netting and the metal requiring protection, and this space filled with the coating of plaster, etc. Without this precaution the supposed protection may be entirely useless.

Referring again to column covering, the porous tile preserved the plate columns from injury in every case; but in many instances the cement bond of the joints was broken, and the tile must be reset.

The growing opinion is that no air spaces should be left around columns, but that the covering blocks should be set directly against the metal and made as solid as possible with mortar or cement.

Fig. 3 shows condition on the eighth floor after the fire.

Fig. 4, the office of the Rapid Transit Commission on the ninth floor, showing the two-ton safe that fell through from floor above.

Fig. 5 shows one of the main columns on the eleventh floor after being stripped for inspection.

Fig. 6, fourteenth floor; showing arches, girders, and column covering, all in good condition.

Fig. 7, fifteenth floor; west side of light shaft, showing the floor where the whole panel fell, and where the 12 in. beams are bent.

Fig. 8, fifteenth floor; showing the most seriously injured steel member. This is the middle section of the 24 in. by 10 in. plate girder, that crosses the Broadway front of the building. The other two sections of the girder are also distorted, but in a less degree. The upper flange was about 10 ins. above the floor, and by an oversight had no fire protection. The upper flange and upper part of the web of this girder were sufficiently heated to buckle and deflect sidewise; this caused it to twist enough to loosen the fireproofing from the lower flange. The girder has sagged somewhat under its load, and appears to have been very near to the point of collapse.

On cooling, the flanges being bent, the original length was decreased, and the strong end connections pulled the sides of the columns slightly out of line. This appears to be the greatest damage sustained by any part of the metal frame, and is entirely due to absence of fire protection.

There is room for great improvement in the construction of partitions within buildings, that is, for partitions so constructed that they will not tumble down as soon as subjected to attacks of fire or of water. Fig. 5 gives an idea of the destruction of these flimsy partitions. To prevent the falling of the blocks over the doorways as soon as the wood frames are burned, the tile manufacturers recommend constructing flat arches over the doorways by setting the blocks on end, as per Fig. 2.

A lesson taught by this fire is that no unprotected metal of extended and continuous lengths should be employed upon the external walls of buildings. The windows of the light shaft were furnished with cast-iron sills, lintels, and mullions. The sills and lintels were 23½ ft. in length. The fire, drawing up past and into the windows, heated and expanded these iron members, in some places sufficient to force the brick wall, that extended 18 ins. beyond the iron, about an inch out of line, and crack it. If we figure the expansion by heat of a bar of iron 23½ ft. long we find that an increase of 350 degrees in temperature will produce an elongation of about $1\frac{1}{16}$ in.

The Home Life Building in its present condition furnishes a very interesting study for the engineer, and it affords proof of the theory that a steel structure may be so protected by other material as to resist fire without material injury.

From the foregoing facts the following conclusions may be drawn, namely, that in a really fire-proof building: —

First. The steel framing should be entirely protected by burned clay or its equivalent.

Second. No combustible materials should be used for floors, doors, door frames, window frames or sashes.

Third. Partitions should be so built as to resist ordinary impacts and pressure of a fire stream.

Fourth. Wire glass should be employed for partition lights and for door lights.

Fifth. Column covering should be more strongly bound together.

FIG. 8.

Sixth. No continuous or extended lengths of iron should be employed in the external walls.

Seventh. All window openings, liable to be exposed to fire from without, should be provided with shutters of iron or some better fire-resisting material.

The Bonding of Brickwork.

BY ERNEST FLAGG.

ONE might say, with a good deal of confidence, that nothing is more certain than that the next few years will witness a great change in the methods of bricklaying in this country. The principles of good design are being so rapidly introduced among us from France, that the present standard of taste in brickwork and also in the use of many other building materials must give way to more reasonable methods. These principles of good taste in design are so simple and reasonable that any child may understand them, and when once understood, they are sure to be applied.

One of the first things that the student of architecture at the French National School has impressed upon him is that good design calls for the use of reason, or let us say common sense, on the part of the designer. A great work of art is necessarily a great achievement of the intellect. Such a work calls into play the highest powers with which we are endowed. Reason must play an important part. Nothing is more sure than that no work of man can be called great which does not show the use of this wonderful gift, which is the measure of man's superiority over the lower animals.

Now, in none of the fine arts is there so great an opportunity for the use of reason as in architecture, and it is doubtless because of this, no less than that it is the mother art, that it has always been considered among the most artistic and enlightened nations of Europe as the chief of the fine arts. The architect is called upon to use his reasoning faculties at every turn, and the success or failure of his work depends upon the use he makes of them. Some there are who have an innate sense of what is admirable, and apply their reasoning powers to their work almost unconsciously. These are they who create masterpieces, and of whom we say they are endowed with genius.

The architect deals with many different materials, and applies them to many diverse purposes. Each of these materials has certain qualities and limitations which he should understand. These qualities and limitations suggest and call for the use of certain appropriate forms and methods of use prescribed by reason or common sense, as adapted to the material for the purpose for which it is used. The knowledge of these qualities and the humble submission to the limitations which common sense dictates is a great aid to the designer, for if he will humbly follow where reason leads the way, all sorts of interesting forms and methods will suggest themselves as appropriate, which otherwise he might not have thought of. Moreover, he will feel safe in their use, for he will know that he is being guided by a true principle of good taste.

A striking illustration of what I mean is often seen in the use of wood in exterior work by architects of our colonial times. The resources of the builders did not permit of the use of stone where it is generally used abroad, and wood was substituted for it, but this substitution involved no slavish imitation of the stone model. The work generally shows that the architect had a keen and logical appreciation of the nature of the material he was using, and its capabilities and the designs are designs for wood, not for stone. Retaining the main features of the classic forms which are founded upon the eternal principles of common sense, he varied the detail in an endless number of ways appropriate to the nature of the material, thus securing a charming variety of fresh and interesting forms, and by the most simple means giving to the work a stamp of good taste and elegance which to see is to admire.

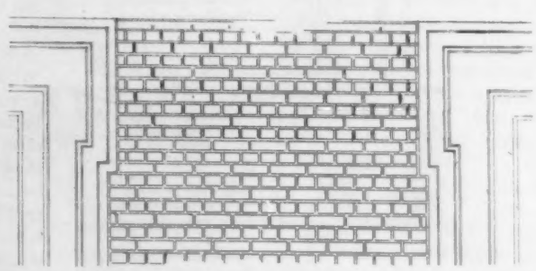


FIG. 1. BRICKWORK FOR SINGER BUILDING.

Joints Recessed ⅜ Inch.

The very common disregard of this principle, which is one of the fundamental principles of good design, is a most glaring defect in much of our modern work.

On every hand one sees in our modern buildings, the dictates of common sense in the use of materials violated, and nothing is more certain than that until such abuses are corrected we need not expect good results, either from the artistic or practical standpoint. How can one expect, for instance, to crown a building with a sheet-metal cornice to which has been given a stone profile, and expect his work to be classed as a work of art? Common sense is violated; the thing is unreasonable on the face of it and cannot possibly be good. If the limitations of cost prescribe the use of sheet metal for the cornice, why should not that material be frankly used in a common-sense way and be given a form adapted to its qualities and limitations, so that it will appear to be what it is? When a man who is acquainted with the qualities and limitations of sheet metal sets himself to work to think how he can make use of this knowledge in designing a cornice that is appropriate to the building, in forms that are appropriate to the material he intends to use, all sorts of new forms and possibilities will suggest themselves to him, and he may accomplish a result truly artistic, for it will at least have in it one of the principles of good taste, that is to say, truth.

Or, as another illustration, say the architect wishes to use iron for a column; how can he expect a good result if he gives it a form which would be suitable for stone, when the nature of the material calls for an entirely different treatment? To do so is to violate the laws of common sense, and he can hope for praise only from those who are deficient in that quality, or from the ignorant.

It ought to require no argument to convince any one that to each material should be given the forms and profiles adapted to its nature. Profiles suitable for granite are unsuitable for marble, and *vice versa;* profiles suitable for a soft stone are unsuitable for a hard one. Forms adapted to wood are not adapted to iron, and forms suitable for iron are not suitable for stone. Cast iron calls for forms of one kind and wrought iron for forms of another kind, and so on indefinitely through the whole list of building materials. To each material should be given the forms adapted to its qualities and limitations, and only by so doing can one hope for good results. The study of each material will suggest new possibilities, and the designer, letting his reason dictate, may venture in safety upon new and interesting fields of design.

His work will be interesting because it will display the working of the human mind and will appeal to the reason of those who see it. This principle of good design should be inculcated into the architectural student at the very beginning. Unfortunately, it is a principle which he will see violated on every hand by men standing high in the profession, whose works are admired by the unthinking or ignorant. But the progress in art in this country is going to be rapid, and not many decades will pass before it will be pretty thoroughly understood here, even among the laity, as it is understood in France, that common sense is a necessary factor in good design; and a man, to stand high in the profession, will find it necessary to call into play all the highest qualities with which the Almighty has endowed him.

In the use of none of the building materials in this country are the principles of common sense more generally disregarded than in brickwork. In the use of this material we easily lead the world in absurdity. So true is this that good brickwork is a thing practically unknown among us, or perhaps one should say unpractised among us, for every one who knows anything about brickwork, or

who has given the subject a moment's thought, knows that the nature of the material requires that there should be practically no vertical joints more than one brick high, but that every brick should interlock with the surrounding bricks both lengthwise with the wall and transversely through it; in other words, that the brick should be laid up in regular bond, of which there are several standard varieties, and which the apprentice everywhere but in the United States is supposed to be taught. With us, workmanship of this character is deemed unnecessary, and our brickwork consequently loses in strength and character, both artistically and constructively, for it lacks a quality of solidity and technique which in good workmanship impresses itself upon the imagination and constitutes a real beauty. So utterly has this common-sense principle of good workmanship in bricklaying died out among us that it is next to impossible to find a mechanic who can lay up a wall in regular bond. In a large force of bricklayers, all passing as skilled mechanics, the writer has often been unable to find one who knew how to lay up a wall all the way through and at the corners in regular bond. Every fifth course a header course, for rough work and backing, and that abomination known as diagonal bond and microscopic joints for the face work, is what now passes here as good workmanship.

Every now and then one reads of the collapse of some building finished or in process of construction; those casualties are usually ascribed to the use of poor material, but in nine cases out of ten they are due to improper bricklaying. New York is full of buildings which stand apparently in defiance of the laws of statics, and doubtless the same conditions exist in other places; it is extraordinary that there are not many more accidents than there are. If provisions were made for the proper bonding of brickwork in all building laws for cities, these accidents would be almost unknown.

In the United States if a building lasts fifty years it is about all that can be expected of it; they are mostly constructed on thriftless principles of economy. The builder loses sight of the fact that for a very slight increase in the cost, or for a little more care in the construction, the life of a building can be almost indefinitely prolonged, and that the saving in repairs alone will far more than offset the increased expense. When in Paris, the writer lived in a building erected in the time of Louis XIII.; it had recently been remodeled at a slight expense, and was as good as new and may be used for hundreds of years to come. The first cost of building in this way was perhaps 10 or 15 per cent. greater than it would have been if built for a life of fifty years. One would think that common dictates of economy would introduce this sort of construction here.

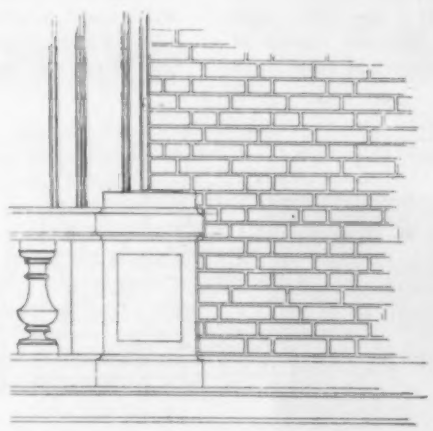


FIG. 2. BRICKWORK OF HOUSE FOR CLARK ESTATE.

The practise of running up certain walls or parts of walls of a building in advance of others is another practise which should never be tolerated by the architect. It is nevertheless a practise which is so common here that one may say it is the general custom to carry up the walls which are composed entirely of common brick in advance of the ornamental façades, and then to connect the two by means of an abomination in bricklaying called toothings. The workman accustomed to laying up his work without proper bond sees nothing inconsistent or slovenly in such a proceeding. It is, indeed, on a par with the rest of the work, that is to say, about as bad as could be contrived; but how can an architect who takes pride in his work permit such practises? They are proceedings which could only be tolerated where pride in good bricklaying is unknown, and that they are common now serves as clearly as anything could to show the present degradation of bricklaying in this country. They are makeshifts, which result from a mistaken notion on the part of the builder that by resorting to them he can hasten the work, but it is evident that the building cannot be inclosed or finished until all the walls are up, and if one part is carried up before the rest nothing is gained. The supposed gain is entirely imaginary, and is accomplished at the expense of good workmanship and in defiance of the common-sense laws of good construction.

It needs no argument to demonstrate that the way to build well is to carry up all the walls simultaneously, interlocking all the materials as the work proceeds. To do otherwise involves an unequal distribution of weight on the foundation during the process of building, which should not be tolerated even if it could be done consistently with good bricklaying, but when this is done in connection with the so-called toothings, it cannot be too strongly condemned.

In the manufacture of fine grades of brick, our progress during the last twenty-five years has been very rapid, and we now produce them in extraordinary variety and of most excellent quality. Strange to say, this progress in brickmaking has not conduced to progress in bricklaying, but rather the contrary. The fine grades are used only for face work, and our designers, losing sight of the fine effects which might be produced by laying them up in regular bond with the backing, have used them solely as a veneer, independent of the main body of the wall, and adding practically nothing to its strength. They are laid in a sort of running bond and are tied to the backing at every fifth or sixth course by what is called diagonal bond. That is, their inner corners are clipped off and the corners of common brick laid diagonally on the wall are lapped over the face work, a process as insecure and slovenly as it is ugly, for by this method the outer veneer has little or no connection with the body of the wall, and looks as if it had absolutely none, appearing to be what it is, weak. The writer has often noticed workmen in taking down old buildings—buildings which would be called new anywhere else—remove great slabs of this outer veneer with a crowbar, showing that there was practically no bond between it and the backing. It seems incredible that such unscientific and inartistic methods could take root anywhere to an extent that architects will deliberately specify this sort of thing; but one who observes our progress in other directions must have far too much faith in the future of good art and its handmaiden, good workmanship, among us to believe for a moment that these methods will endure. At present, this way of laying brick, considered very ugly everywhere else, seems to be admired here. It was first adopted through false notions of economy, but we now find it used almost everywhere in buildings where such considerations evidently did not govern, as well as in buildings of the cheaper kind.

With the introduction of the fine grade of bricks, we have developed a love for fine joints, and this class of work is laid up with joints so thin as to be of no use constructively, and which rob the work of all character, and give to it a hard, dry, sleek appearance, which can appeal to no artistic instinct. Now and then we find an attempt at Flemish or English bond, doubtless made by some one who has seen and admired the genuine article abroad or in old buildings, in this country, but almost all such attempts are sham, for the face is not really bonded to the backing. The headers are not headers, but bats, because the designer cannot bring himself to give up the small fine joints, and to use joints of a size which is necessary to insure good workmanship; with the thin joint retained it is impossible to interlock the face work with the backing. In other words, our brickwork is laid upon the theory that honesty is inconsistent with art. To vary the general monotony sometimes recourse is had to bricks of peculiar shapes, such as the long, narrow, thin bricks called Roman, which do not and could not bond with the backing. Many people think this variety truly artistic. Few seem to realize that the finest

and most artistic effects can be produced by simple means, or to understand what needs only to be tried to be proven, that brick of the commonest kind laid up in interesting and logical bonds will produce far finer effects than the most expensive bricks or the craziest shapes that ever were made, if laid up without regard to the rules of common sense.

One has but to try to find how easy it is to devise all sorts of interesting patterns and endless varieties of beautiful wall surfaces by the use of brick of the standard size regularly bonded to and forming an integral part of the body of the wall. The supposed economy of the present methods, like many other thriftless attempts in the same direction not founded on reason, which spring up in new countries, will be found upon examination not to be economical, but the reverse. With a very slight increase in the number of face brick, the outer 4 ins. of the wall, now practically useless, can be made to contribute its proportionate share to its strength. Let us make some calculations to show how slight is this increase, and how out of all proportion to it is the saving effected. In New York face brick is generally laid up ten courses to 25 ins. and common bricks nine courses to 2 ft. If the face brick is made to bond with the backing, it too will lay up nine courses to 2 ft., or better still, for face brick and backing, nine courses to 25 ins.; then 8.64 face bricks and 10.8 common bricks will be required to each square foot of a wall 1 ft. thick. By the common method there would be required to accomplish the same result 7.2 face bricks and 13.5 common bricks, so that by the use of 1.44 more face bricks, against which there is a saving of 2.7 common bricks, we obtain a wall which is practically one third stronger, for the outer 4 ins. is an integral part, whereas in the other case it is a veneer of little or no value as regards strength.

This calculation is made upon the supposition that for every stretcher there is used a header (Fig. 1); but, if greater economy in the use of face brick is required, good results may be obtained, and interesting patterns devised, by the use of a less number of headers in proportion to the stretchers (see Fig. 2), where one half as many headers are used as in Fig. 1. In this case a square foot of wall surface 1 ft. thick would require 7.56 face bricks and 11.88 common bricks, so that this would require only .36 more of a face brick, against which there would be a saving of 1.62 common bricks.

The taste for good workmanship is fortunately a taste very easily acquired; familiarity with it breeds a desire for more, and when the difference between the appearance of good bricklaying and bad bricklaying is once understood, the demand for the former will spread rapidly. There is now urgent need for good manual training schools where young mechanics can be taught good workmanship in bricklaying; or rather, perhaps one should say, there is urgent need that good bricklaying should be taught in the manual training schools which are already established. It ought to be no more expensive to lay up brick in regular bond than by the "every fifth course a header course" system. That it is more expensive to do so is entirely owing to the fact that the bricklayers are unskilled in the art of good bricklaying. They do not know how to lay the regular bonds because they have never been taught, and if they attempt to do it, of course the progress is slow, and time means money. But if the architects would specify work of this character, there would soon spring up a demand for skilled workmen, and the mechanics would soon adapt themselves to the new conditions; it would soon be demonstrated that good bricklaying costs no more than bad bricklaying, and the benefit both from the artistic and constructive standpoints would be worth a thousand times the cost of introducing this reform.

In the large Eastern cities there is fast being created a great body of skilled mechanics in almost every line, except bricklaying, that has to do with building. This has come to pass because there has been a demand for fine workmanship which has been specified regardless of expense. The building up of these industries and the creation of this body of skilled labor has been of incalculable benefit to the country, and is worth a great deal more than it has cost. Bricklaying is the only building industry which seems to have made rather the reverse of progress during this century.

Brick and Terra-Cotta Work In American Cities, and Manufacturers' Department.

NEW YORK. — The year of 1899 promises to be an exceptionally busy one, if the amount of work which has been postponed on account of the war is any criterion.

In the meantime architects are preparing in every way to make the Fourteenth Annual Exhibition of the Architectural League a great success. In connection with this exhibition two prizes and a gold and silver medal will be awarded to winners of three competitions, details of which are given elsewhere in this issue.

Among items of new work may be mentioned: —

C. L. W. Eidlitz, architect, has planned a four-story brick telephone exchange office to be built on East 30th Street; cost, $30,000.

H. T. Howell, architect, has planned a seven-story brick apartment to be built on 90th Street, near Central Park; cost, $95,000.

Mr. J. Pierpont Morgan has purchased for $148,000 a site for a new club house for the New York Yacht Club, and presented it to the club; $75,000 has been subscribed toward the building itself, and a limited competition is now being held, in the result of which considerable interest is felt. Among the architects who have been invited to compete are Charles C. Haight, Carrere & Hastings, and McKim, Mead & White.

PHILADELPHIA. — The recent Peace Jubilee has left the desire in many minds to have a permanent memorial erected in the heart of the city, — a memorial that would not only serve to keep fresh before us the successful termination of war, but one that would, in addition, be an architectural ornament to the city. The public were intensely pleased with the Jubilee Court of Honor, designed by Joseph M. Huston, architect, consisting of an arch spanning Broad Street with what was really a court north and south of it, formed by detached triumphal columns. At first blush an outcry was made to have this reproduced in white marble (the original being staff), but this was, of course, out of the question, both on account of expense and inconvenience resulting from blocking

TERRA-COTTA FIGURE, RITTENHOUSE APARTMENTS, PHILADELPHIA.

Executed by the Perth Amboy Terra-Cotta Company.
Willis G. Hale, Architect.

RESIDENCE FOR HARVEY CHILDS, JR., ESQ., PITTSBURGH, PA.
Peabody & Stearns, Architects.

the sidewalks of a main street. Then came suggestions for various substitutes, which gave architects generally grave fears for the outcome. The T Square Club pledged themselves to give a handsome subscription, and it is the hope of all, that, should the memorial finally be built, the leading members of the club may see to it that some entirely satisfactory design be selected.

Architectural exhibitions have been growing year by year more and more important, and perhaps in no city has this fact been more noticeable than in Philadelphia. For years the Pennsylvania Academy of the Fine Arts had been running an architectural exhibit, but only as an aside to its annual fine arts exhibition, and architecture was gradually becoming very poorly represented, until a few years ago the T Square Club assumed charge. The improvement was immediate and lasting, for each year's exhibit has been an improvement, both in quantity and quality, over the last. The entries for this season's exhibition are now in and promise to keep up the advance. It would seem that one helpful adjunct to the usual array of original drawings of current architectural work might be found in the best of the architectural magazines, the latest yearly volume of each of which could be placed convenient to the hand of the visitor, thereby giving him a broader view of architectural achievement.

Mr. Frederick M. Mann, architect, who, within the year, has allowed the calls of his practise to take him away from professorship at the University Architectural School, has just been successful in a most fairly conducted competition for a church at Overbrook. As showing the proper feeling that exists amongst architects here, it may be stated that after the award was made, an exhibition of the competing designs was held by permission of the competitors, when Prof. Warren P. Laird, who had acted as adviser to the church committee, gave an interesting talk on the method that had been followed in getting up the terms of the competition and in the decision. It seems that the interested members of the profession met, when a draft of the proposed terms was laid before them, and their criticism and suggestions taken before the terms were finally adopted. Professor Laird deprecated the fact that there were eleven competitors instead of from four to six, as he would have wished, but the committee had, in the main, followed his ideas of equity, outside of this one point. Cope & Stewardson were placed second, and David K. Boyd, third.

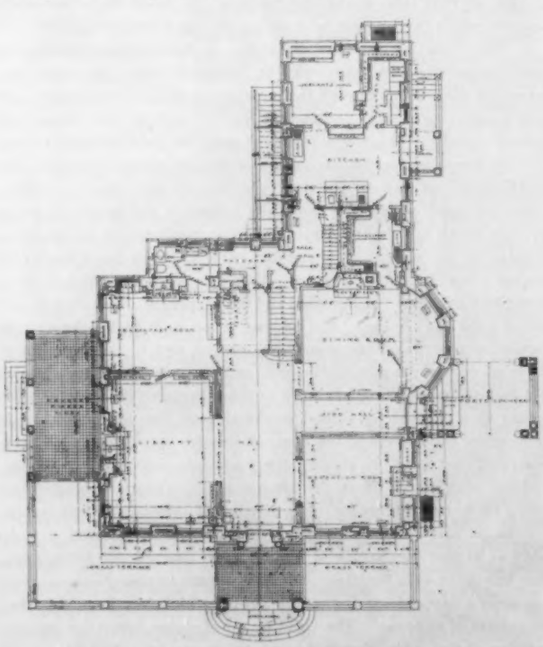
A new front for the Academy of the Fine Arts building on Broad Street is reported from the office of F. M. Day & Bro. All familiar with the present façade will be curious to note the change.

Cope & Stewardson's design for the new law school at the University of Pennsylvania is about to be put into execution. To be built in the neighborhood of the dormitories, by the same firm, its material will be approximately the same, while the architecture is of a later period of English Renaissance. Like the dormitories, the cornices, window frames, etc., will be of light stone, while the body of the walls is of reddish brick with Flemish bond.

Mr. Seeler is about to put up the east portion of his high building at Broad and Chestnut Streets, for the Real Estate Trust Company. This building, although of one continuous design, had to be built in two sections, on account of an unfinished lease on part of the old property.

MINNEAPOLIS.—I was impressed, upon reading the current BRICKBUILDER, with the very general sentiment as to next year's business promises. All reports indicate a stagnation just at present, but the prospects for 1899 are conceded to be the best for years. So it seems to us here in the Twin Cities. While the past year has been a disappointment to most of us, perhaps, we can readily understand it when the eventful year now closing is considered. No doubt the enforced quietude of the past two or three years will result in a healthy forward movement that will average matters up in an eminently satisfactory manner.

The closing up of the year's work is practically all that is stirring with us to-day. Winter has set in at an earlier date than for several years past, so nothing new of importance will be undertaken now before spring. The new Milwaukee depot is now being used, although not entirely finished. It is a credit to its owners and a sub-



FIRST FLOOR PLAN, HOUSE FOR HARVEY CHILDS, JR., ESQ., PITTSBURGH, PA.
Peabody & Stearns, Architects.
(Scale Drawings of Elevations shown in Plate Form.)

EAGLE ON DOME OF PUBLIC LIBRARY AND MUSEUM, MILWAUKEE, WIS.
Executed in Terra-Cotta by the Northwestern Terra-Cotta Company. Ferry & Clas, Architects.

stantial addition to our business architecture. The residences of George T. Partridge and S. A. Harris are nearing completion, and will rank with our finest residences. They are all of Roman buff brick and terra-cotta and mark a substantial advance in our development as a city, a foretaste of what is to come. Our new State Capitol is nearly ready for roof framings and is a decided credit to the State. The periodical agitation looking to completion of our new City Hall has set in, and we hope this time it will result in something tangible, as it is a much-needed improvement.

Among the projects for next year that are known to date are: a new chamber of commerce, three or four new churches, two or three new school buildings, two new buildings at State University, hotels, warehouses, store and office buildings, and residences, etc., almost innumerable. We are promised a new government building in the near future, a promise we fervently hope to see fulfilled. Our present building has never been adequate, the business having outgrown the building during its construction. We trust, in the event of a new building, to see it made the subject of local competition and awarded to a Minneapolis man. We know it will mean a better adaptation to necessities and more vigorous prosecution of the work, as well as a substantial saving in cost.

SEAL OF NEW JERSEY, EAST ORANGE TOWN HALL.
Executed in Terra-Cotta by the Conkling, Armstrong Terra-Cotta Company.
Boring & Tilton, Architects.

ST. LOUIS. — At a special meeting of the St. Louis Architectural Club, held on October 22, the constitution and by-laws were so amended that the annual meeting will be held the first Wednesday in April hereafter instead of January, and the monthly meetings on the first Wednesdays of each month instead of the first Saturdays. The changes were thought advisable that the social features, which still occur on the first Saturday evenings of the month, might not be curtailed or of themselves interfere with the business meetings, while the annual meeting will take place at the close of the working season, that it may not interfere with the club work by a change of administration.

An important event in the history of the local Young Men's Christian Association was celebrated on November 30, in the formal dedication of their new building, corner of Franklin and Grand Avenues. It is five stories, fire-proof, and cost $200,000. Tully & Clark were selected architects, through a competition held in the spring of 1894. Work was commenced at once, but the financial depression prevented raising sufficient money to finish it until this season. The secretary's office and general reception room, reading room, etc., are on the second floor. The gymnasium is in the rear, extending from basement to second floor, and above this is the main auditorium, with a seating capacity for one thousand. Swimming tank, baths, bowling alleys, etc., have been provided in the basement. The roof has been designed for use for summer concerts, etc.

TERRA-COTTA FIGURE, RESIDENCE AT KANSAS CITY, MO.
Executed by the Winkle Terra-Cotta Company.
F. E. Hall, Architect.

During November the Board of Education, W. B. Ittner, architect, took out building permits for a three-story school, 106 by 90 ft., cost, $69,000; a two-story school, 28 by 90 ft., cost, $15,000; and a two-story school 100 by 50 ft., cost, $30,000.

It is with considerable embarrassment that St. Louis acknowledges that she cannot get that which she most needs; and her confession is the strongest evidence that she needs it. Two unsuccessful attempts have been made to vote a half mill on the dollar tax for five years, for the purpose of erecting a public library building. The present building is wholly inadequate, either for the service required or as a proper protection, it being neither fire-proof nor designed for the purpose, it having been arranged for the library when it was merely the public school library. Since becoming a free library it has grown greatly and should have a permanent home.

Messrs. Barnett, Haynes & Barnett have prepared plans for a $150,000 residence in Belle Place, and architect Louis Mullgardt has an apartment house on the boards, to be built opposite the Grand Avenue entrance to Vandeventer Place, at a cost of $30,000.

CURRENT ITEMS OF INTEREST.

THE WINKLE TERRA-COTTA COMPANY are furnishing the architectural terra-cotta for the new armory building at St. Louis,

TERRA-COTTA PANEL, CONVERSE BUILDING, BOSTON.
Executed by the Excelsior Terra-Cotta Company. Winslow & Wetherell, Architects.

also for the Reliance Realty Company's new office building (eleven stories), 6th and Olive Streets, St. Louis.

THE KITTANNING BRICK AND FIRE CLAY COMPANY have secured an order for interior linings for Allegheny County House, Woodville, Pa.; also have brick specified for interior of St. Francis de Sales Church, McKee's Rocks, Pa.

TERRA-COTTA PANEL.
Executed by Gladding, McBean & Co., San Francisco, Cal.

THE POWHATAN CLAY MANUFACTURING COMPANY are supplying their cream-white bricks for the new Hall for the Board of Education, New York City, N. LeBrun & Sons, architects; also for the new theater building being erected at 42d Street and Seventh Avenue, New York City, for the Hammerstein Amusement Company.

THE BRICK, TERRA-COTTA, AND SUPPLY COMPANY, Corning, N. Y., have commenced the erecting of another muffled kiln. This is the third muffled kiln constructed this year by the company, who have also built a large brick kiln, enlarged dryers, and made other necessary improvements to their property.

THE ILLINOIS SUPPLY AND CONSTRUCTION COMPANY report contract to furnish 100,000 gray brick to be used in the new armory building now being erected for Light Battery A, of Missouri, at Grand Avenue and Rutger Street, St. Louis; also contract from Lincoln, Neb., and one at Muncie, Ind., for the same kind of press brick.

THE CANTON SPARTA BRICK COMPANY, Canton, Ohio, have recently added new screens and shape machinery to their plant; built a large storehouse to facilitate shipping brick in winter, and otherwise enlarged and improved their works. The company state that under their present advantages they are making a better brick than ever before.

THE FAWCETT VENTILATED FIRE-PROOF BUILDING COMPANY, LTD., have just completed the structural steel and fire-proofing for boiler house in yard of House of Correction, East Cambridge, Mass., O. W. Cutter, architect; also fire-proofing of Home for Aged People, Mt. Auburn Avenue, Cambridge, Mass., Stickney & Austin, architects.

THE CELADON TERRA-COTTA COMPANY is supplying the roofing tiles for residence, E. T. Affleck, Columbus, Ohio, Yost & Packard, architects; Episcopal Church, Ambler, Pa., M. B. Bean, architect; Memorial Library Annex, Westerly, R. I., Longstaff & Longstaff, architects; residence Geo. Crilly, Chicago, W. C. Zimmerman, architect.

THE EXCELSIOR TERRA-COTTA COMPANY, of New York, have just executed for Mr. Robert Maynicke, architect, the semi-glazed white terra-cotta for a ten-story office building on the northwest corner of Fifth Avenue and 19th Street. This is the only building, with but one exception, in which semi-glaze terra-cotta has been used in New York City, and the material has attracted a great deal of favorable attention.

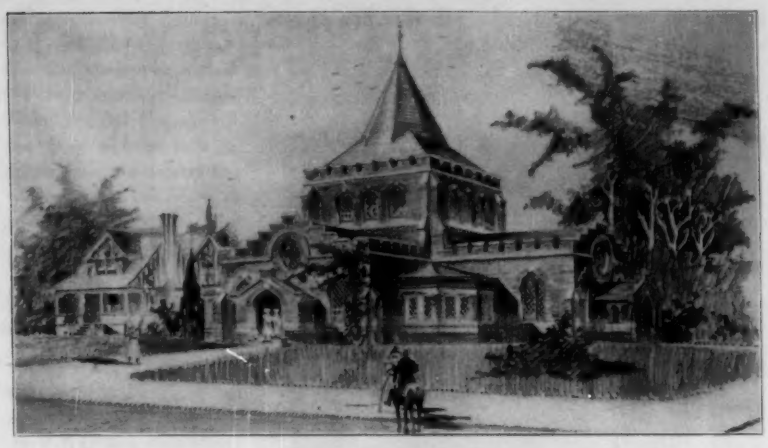
THE DAGUS CLAY MANUFACTURING COMPANY, Daguscahonda, Pa., report that they are supplying the brick for three Pittsburgh buildings having ornamental fronts. Colors are to be dark flashed, gray and old gold speckled. They are also supplying 50,000 pink brick for P. J. Carlin & Co., Brooklyn; the front brick for the new store building of Reynolds Hardware Company, Reynoldsville, Pa., and for a number of buildings at Philadelphia.

THE BERLIN IRON BRIDGE COMPANY, of East Berlin, Conn., are erecting for the Waterbury Manufacturing Company, Waterbury, Conn., a new blacksmith shop, two stories high. The building is to be of fire-proof construction throughout. The roof has steel trusses supporting the covering of corrugated iron, lined with the Berlin Iron Bridge Company's Patent Anti-Condensation Lining. The building is about 40 ft. square.

AT a special meeting of the board of directors of the Atlantic Terra-Cotta Company, held last month, De Forest Grant was elected president and general manager; W. Harris Roome, vice-president; Richard T. Wainwright, secretary. The company wish announced the fact that they are now making a specialty of extra large pieces of terra-cotta with true alignment; also white terra-cotta without slip, guaranteed not to dissolve.

A NEW factory is being erected at Lowell by the American Mason Safety Tread Company, of Boston, to accommodate its increasing business. The demand for the product of the company is growing by leaps and bounds, as architects throughout the country become acquainted with its merits. It is found particularly applicable

SEAL OF THE NEW YORK ZOOLOGICAL SOCIETY BIRD HOUSE, BRONX PARK, NEW YORK CITY.
Executed in Terra-Cotta by the Atlantic Terra-Cotta Company.
Heins & La Farge, Architects.



COMPETITION DESIGN FOR THE METHODIST CHURCH AT SOUTHPORT, CONN.
Hobart A. Walker, Architect.

to schoolhouse stairs, whether of wood or iron, and its use has been specified in a great many of these buildings in various cities. Work on the equipment of the great South Terminal Station, Boston, has just been completed.

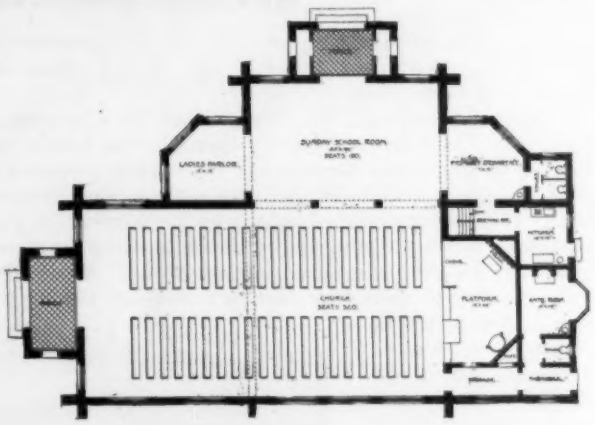
THE OHIO MINING AND MANUFACTURING COMPANY, through their Pittsburgh agents, Burgy & McNeill, have closed a contract with the board of school control to furnish 200,000 face brick for the new building to be erected in twenty-second ward, Pittsburgh, Pa.; E. J. Carlisle & Co., architects; building will cost $175,000. Messrs. Burgy & McNeill are furnishing 150,000 buff brick for new courthouse and jail, Washington, Pa.; also the Norman gray brick for W. A. Zahn residence, Crafton, Pa., and 100,000 buff brick for Crafton M. E. Church.

THE MOSAIC TILE COMPANY, Zanesville, Ohio, report the following orders: tiles for the floors and walls of the new convent building of the Sisters of St. Francis, at Oldenburg, Ind., in which will be used about 28,000 sq. ft. of their Ceramic Roman Mosaic Tile; 15,000 sq. ft. of Ceramic Roman Mosaic Tile in the floor space of Montgomery Bros.' jewelry store at Los Angeles, Cal.; 30,000 sq. ft. Ceramic Florentine Mosaic Tile, 6 by 6 in. plate with inset designs, for the floors of the C. H. Allen & Co. building, at Fort Wayne, Ind., B. S. Tolan, architect.

THE ATLANTIC TERRA-COTTA COMPANY are supplying the architectural terra-cotta for the following buildings: Bird House and Reptile House for the New York Zoological Society, Heins & La Farge, architects; apartment house, 129th Street and Third Avenue, New York City, Kurtzer & Rohl, architects; Home for Indians, Buffalo, N. Y., Barney & Chapman, architects; apartment house, 65th Street, New York City, J. E. Ware & Son, architects; apartment house, 123 E. 16th Street, New York City, Alex. O. Finkle, architect.

AT the annual meeting recently held by the stockholders of the Burlington Architectural Terra-Cotta Company, T. Arlington Macan was appointed general manager. This is a radical change, by which the responsibility of conducting the entire plant is placed under new control. Mr. Macan has an extended reputation in the terra-cotta industry, as being thoroughly conversant with all the details of manufacture, and being fully competent to successfully conduct any business in this line put under his supervision. The company report the general condition of their business as being most promising, their past season having been very successful.

THE recently constructed subway under Avon Street (Boston), connecting the main store of Jordan, Marsh & Co. with their new building, contains a very handsome lining of enameled brick tile furnished by The Grueby Faience Company. The side walls of the whole interior are finished in this material, from the coping of the ceiling arch to the floor, some six feet. The color treatment is most effective, consisting of cream-white tiles between an 8 in. base of green slate and a frieze and cornice of dull green enamel. The company wish



PLAN, COMPETITION FOR THE METHODIST CHURCH AT SOUTHPORT, CONN.

announced that Mr. Philip McKim Garrison, Mohawk Building, 160 Fifth Avenue, New York, N. Y., has been appointed New York agent to handle their product in enameled and faience building materials.

HOUSES, BROOKLINE, MASS.
Shepley, Rutan & Coolidge, Architects.

CHAMBERS BROS. COMPANY, Philadelphia, Pa., report that they have the present month either made shipment or received orders to ship the following machines: one of their largest size automatic end-cut brick making machines shipped to Virginia; one large size automatic side-cut brick machine, with other fixtures,

to Louisiana; an intermediate size automatic side-cut machine to Georgia; and an automatic end-cut machine to Alabama; besides these, they have other work in preparation on orders calling for shipment after January 1. The company call attention to the fact that the machine sent to Louisiana is to be erected in a yard adjoining that on which was placed, about a year ago, their first No. 1 Automatic Side-Cut Machine, — a good evidence that the first machine has given thorough satisfaction.

RESIDENCE AT BUFFALO, N. Y.
McKim, Mead & White, Architects.

We were much interested to learn recently of what we believe is the first instance of a firm of American manufacturers of burnt clay fire-proofing being awarded contracts to supply their product to building operations in foreign countries. This has been done in the following instances by The Pittsburgh Terra-Cotta Lumber Company, Pittsburgh, Pa. The contract for fire-proofing a building for The Tramway Power Company, Dublin, Ireland, was awarded to them several months ago. This material, amounting to about 1,500 tons, was shipped from their works at East Palestine, Ohio. They also sent men to Dublin to set the material, and have since been advised that everything in connection with the work was satisfactory, and the parties exceedingly well pleased. Another contract amounting to about 1,000 tons for a municipal building has been awarded them from Mexico City, Mexico. The construction on this has not yet been started, but the tile, which was made at their works at Port Murray, N. J., is now *en route*. Men to set this material will be sent by the company.

We have received the following communication from Messrs. Randolph & Clowes: —

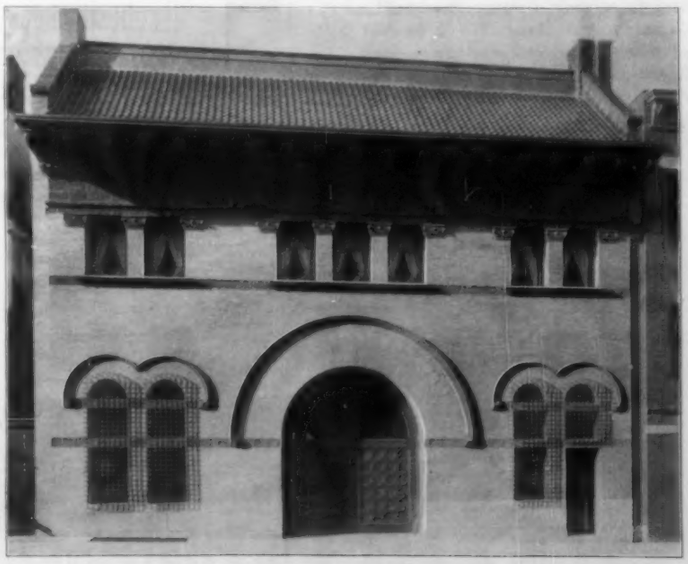
Waterbury, Conn.,
Dec. 3, 1898.

Because of the excessive storm in this locality, the roof of our brass and copper rolling mill caved in on Sunday morning, November 27, on account of which we have been somewhat delayed in filling orders for this class of material during the past week.

The entire brass and copper mill will be in full operation December 12. No damage or interruption occurred in any other department of the works, and the seamless tube, brazed tube, kettle boiler plants were in full operation Monday morning, November 28, as usual. The damage to the machinery was very small, less than $1,000, and the cost of replacing the roof with a permanent and substantial wooden roof will not exceed $6,000, or if an iron roof is used will not exceed $12,000, which expenditure will put the mill in better condition than before the accident.

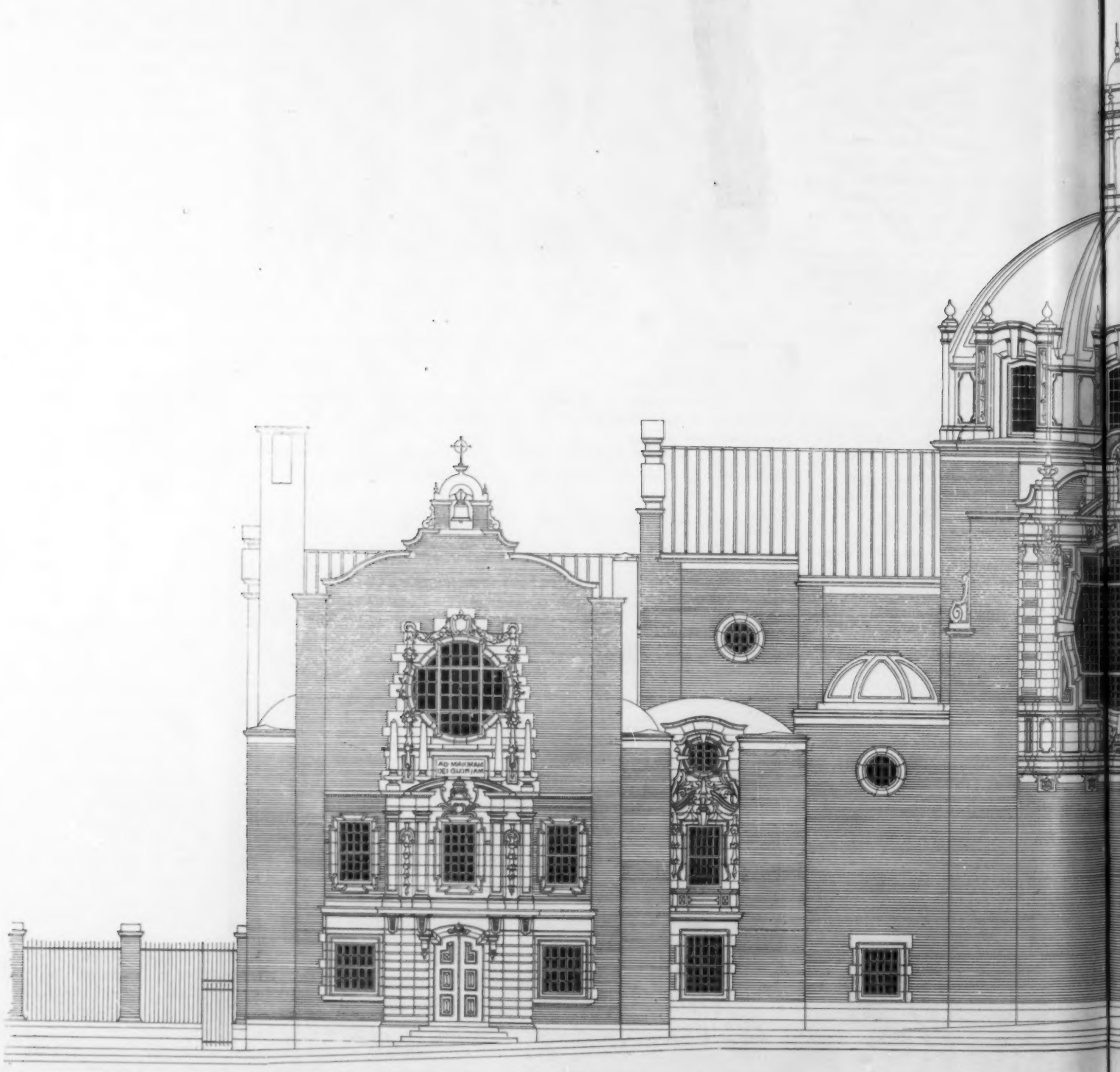
The Boston & Maine Railroad Company are erecting at Portsmouth, N. H., a building for their Electric Power Station. The building is 118 ft. wide and 64 ft. long, divided into two rooms: one for the boilers, and the other for the engines and electric generators. The side walls are of brick, the roof construction fire-proof; the trusses are of steel, and they support steel beams for the purlins, on which is to be placed a concrete roof. The contract for the steel work was given to the Berlin Iron Bridge Company.

For the past month the Grueby Faience Company have been holding an exhibition sale of their products in pottery at the Westminster Chambers, Boylston Street, Boston. From an artistic and also a commercial standpoint, this exhibition has been deservedly successful, attracting much interest among those appreciative of fine ware. The Grueby pottery has an individuality that gives it a distinctive position in this art, both in its glazes, which vary from the rich and brilliant in character to those with soft, dull blooms, and in its beauty of design, wherein every line is indicative of natural forms of floral life. We have in our pages recently described at some length the remarkable qualities of this ware, so will not now touch further on the matter, except to say that their latest efforts have been productive of even finer results than had been achieved at date of our article.



HAVEMEYER STABLE, NEW YORK CITY.
Thayer & Wallace, Architects.

The American Enameled Brick and Tile Company have recently furnished, through their Boston agent, John W. Hahn, the enameled brick used in the Rhode Island Hospital, at Providence, Stone, Carpenter & Wilson, architects; also the enameled brick used in a new primary school at South Boston, William H. Besarick, architect.



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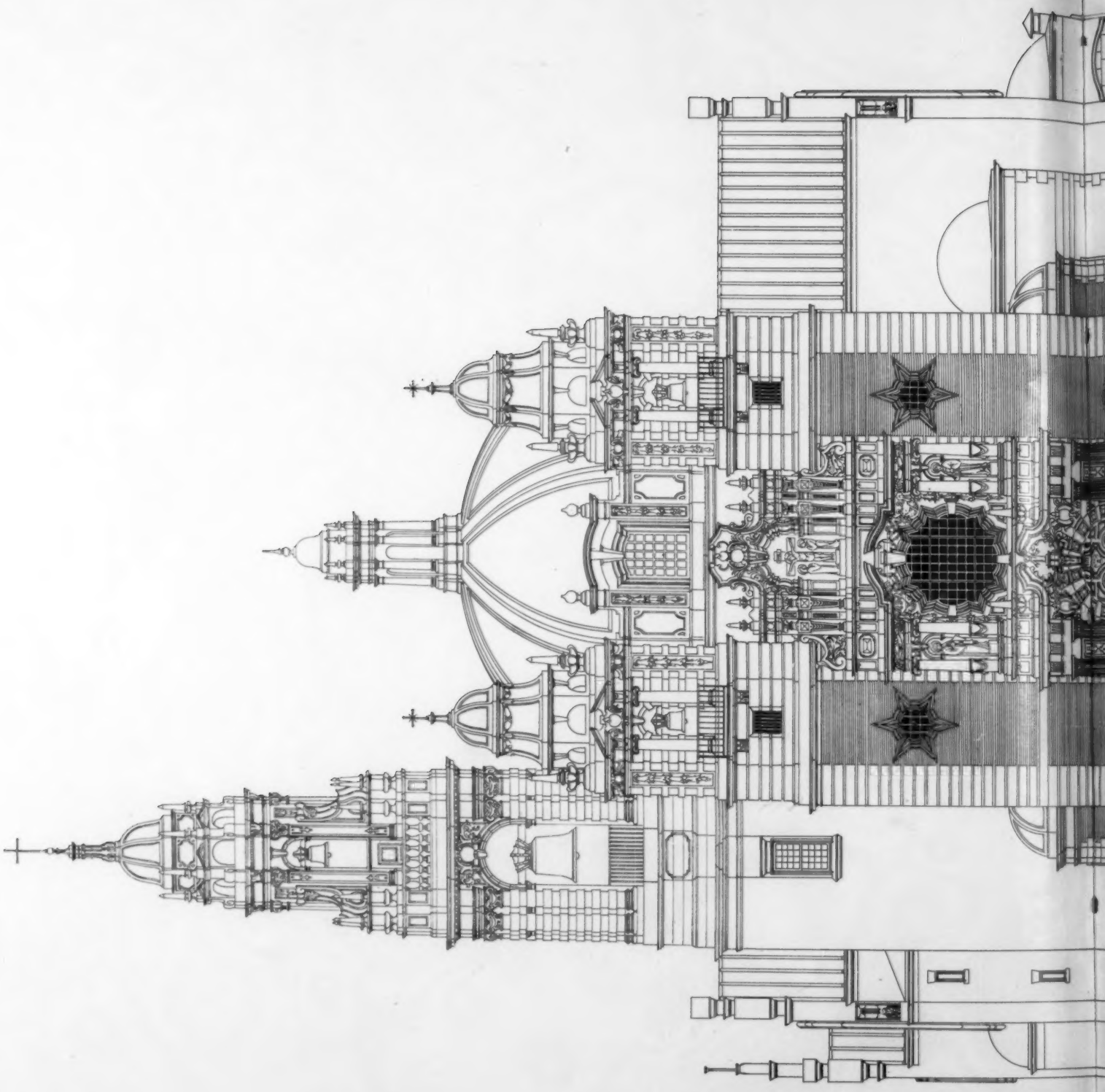
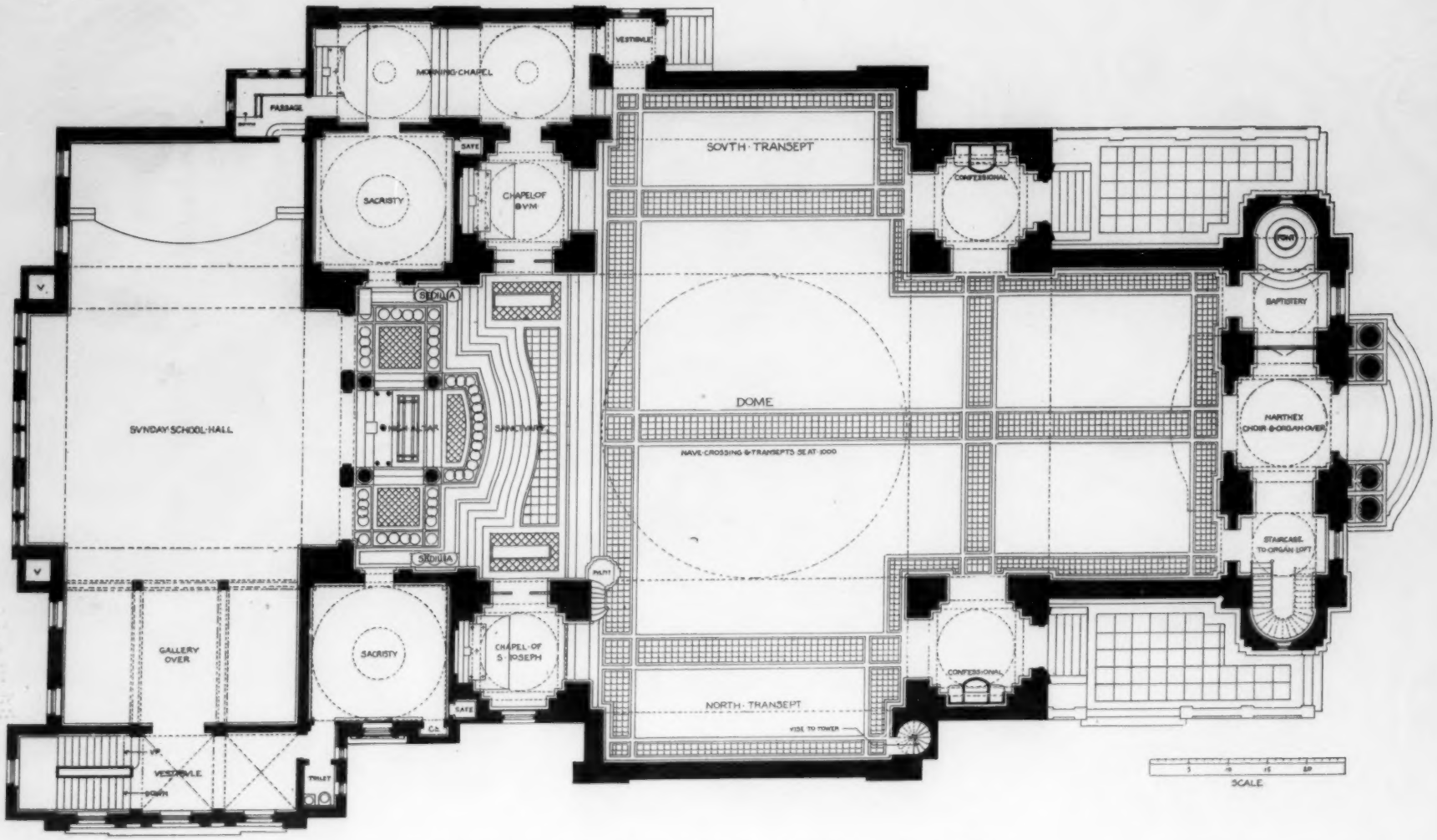
CRAM, GOODHUE & FERGU

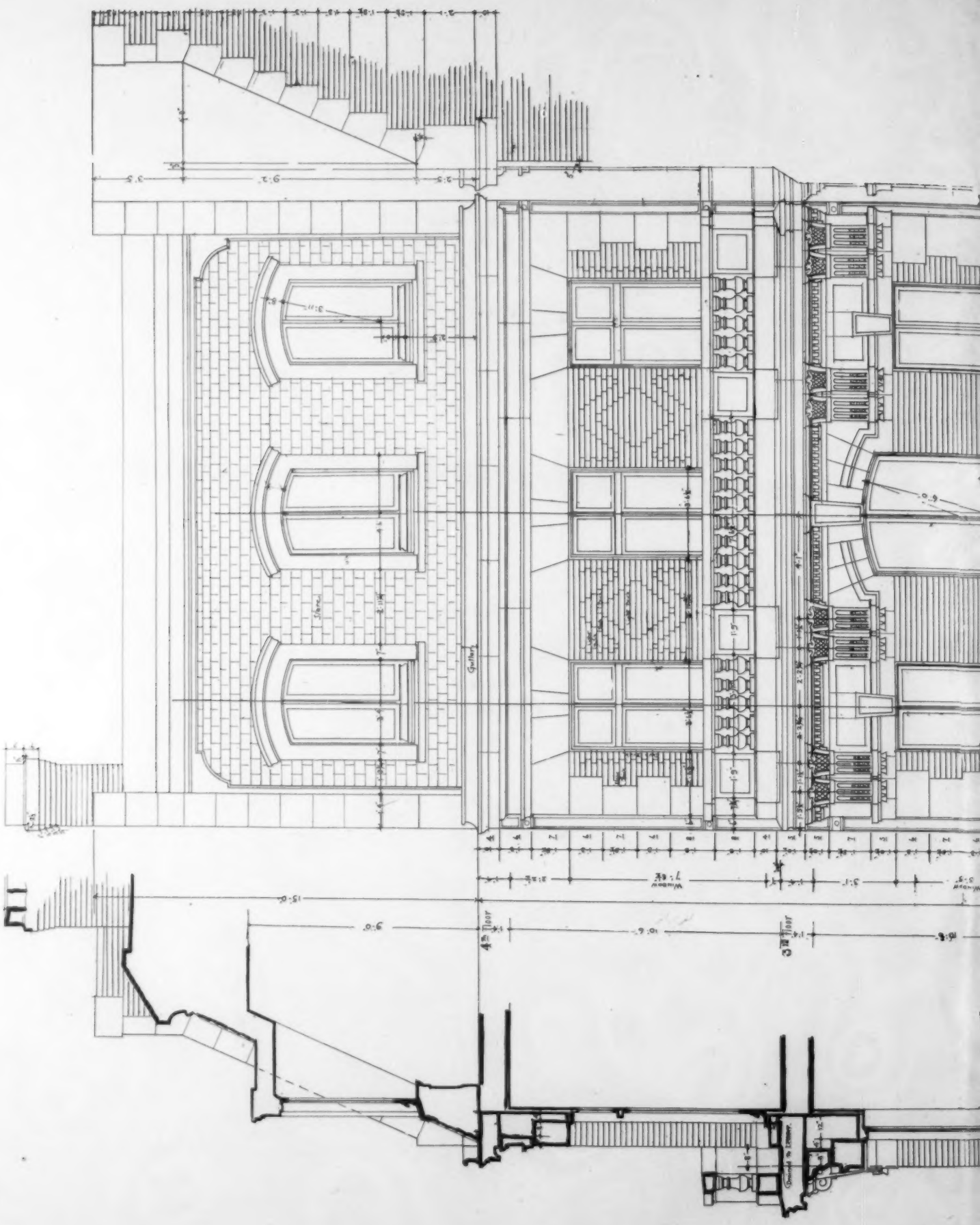
ND PAUL R. C.), FALL RIVER, MASS.
DHUE & FERGUSON, ARCHITECTS.

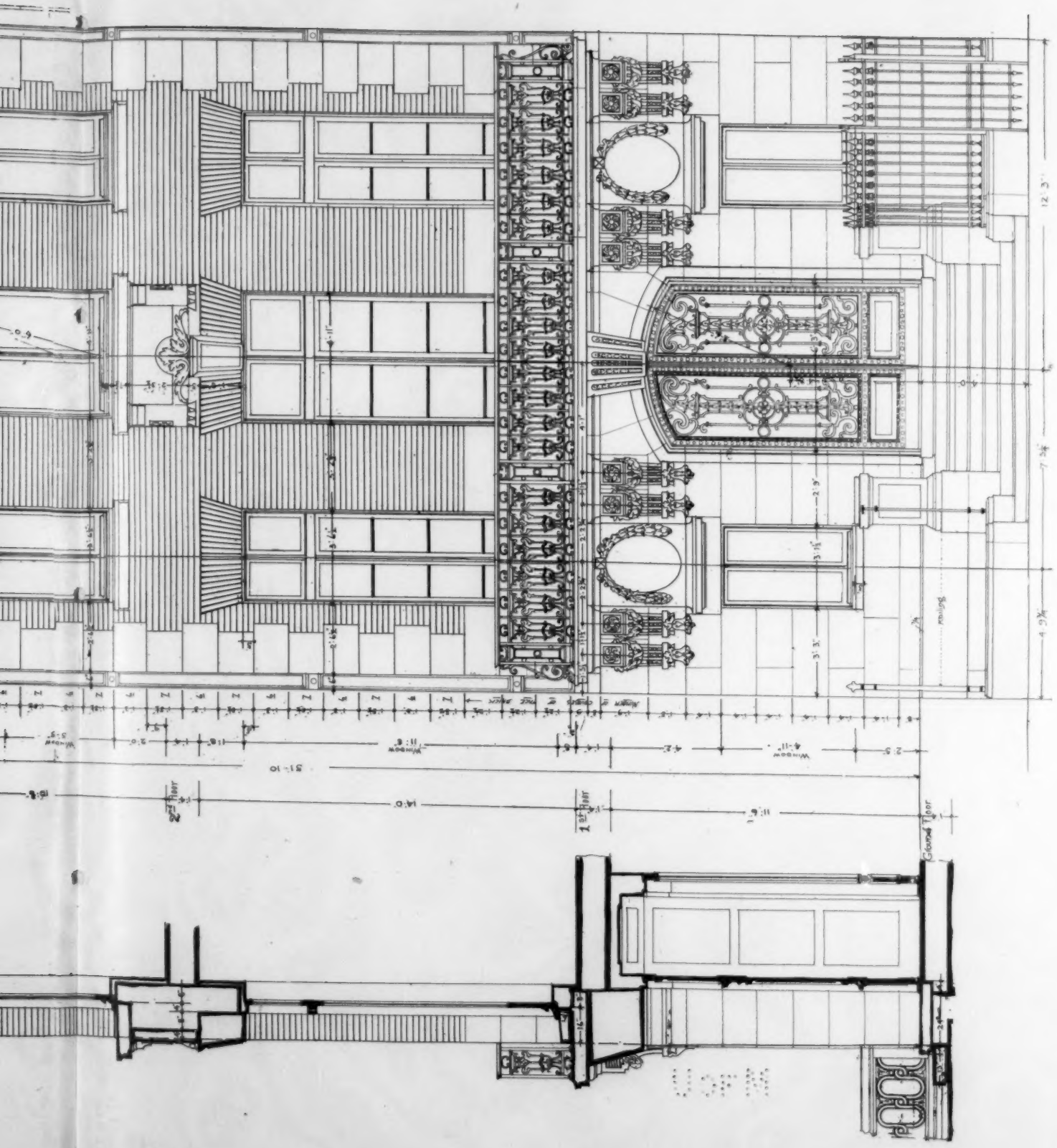




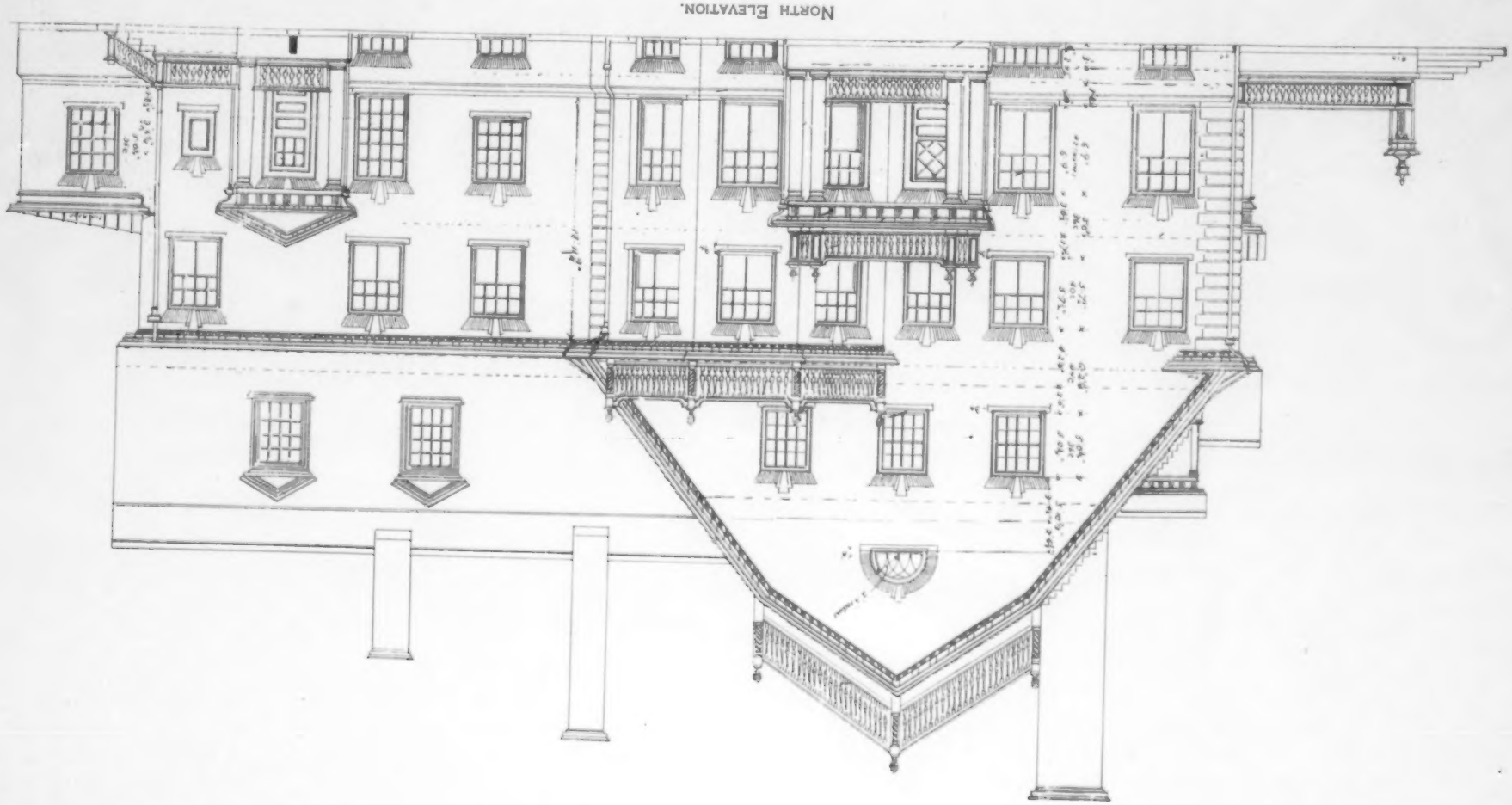
CHURCH S. PETER AND PAUL (R. C.), FALL RIVER, MASS.

CRAM, GOODHUE & FERGUSON, ARCHITECTS.


4th Floor
3rd Floor
Ground & Lower


2nd Floor
1st Floor
Ground Floor
Window
Window
Window

NORTH ELEVATION.



WEST ELEVATION.

FRONT ELEVATION.

HOUSE FOR HARVEY CHILDS, JR., ESQ., PITTSBURGH, PA.

PEABODY & STEARNS, ARCHITECTS.

Plates. Drawings by N. Le Brun & Sons.
Drawings by Edward Pearce Casey.
Drawings by T. Henry Randall.
Drawings by Algernon S. Bell.

THE BRICKBVILDER

DEVOTED TO THE INTERESTS OF

ARCHITECTVRE IN MATERIALS OF CLAY

PVBLISHED MONTHLY
BY ROGERS AND MANSON
OFFICE 85 WATER STREET BOSTON MASS.

VOLVME SEVEN
NOVEMBER MDCCCXCVIII
NVMBER ELEVEN

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CURRENT ITEMS OF INTEREST.

We are in receipt of a very interesting treatise issued by Merchant & Co., Philadelphia, entitled, "How Roofing Tin, Good and Bad, is Made." The facts contained in this little work are, we believe, not known to the architectural profession generally, and are certainly well worth their attention and consideration. The methods of manufacturing roofing plates are briefly outlined, and the two ways by which such plates are coated are described. Particular stress is made of the fact that it is quite impossible to determine by the eye, or any known test, whether or no a plate has been coated by an acid flux or by a palm oil flux, and for this reason the architect should satisfy himself that all plates employed by him in his work are made by reputable concerns, that manufacture goods by that process only which uses the palm oil as a flux. Considerable information is given regarding the system of stamping of sheets as indicating their relative weight, etc., also what to guard against in being misled in this respect by unscrupulous manufacturers. Merchant & Co. will be pleased to mail a copy of this work to any parties interested in same.

In connection with the Convention of the National Brick Manufacturers' Association to be held at Columbus, Ohio, February 7–10, the Baltimore & Ohio Railroad Company announce that they will take pleasure in reserving a special car for the exclusive use of the members from New England and New York going via their system. A similar courtesy was extended by this company last year when the convention was at Pittsburgh, and proved most agreeable to the members from this section. The fare for the round trip will doubtless be based, as heretofore, on the rate of a full fare one way and one third. Privileges of stop-over at Pittsburgh and Washington will be included. In order that the railroad company may know how many to provide accommodations for, they request members in New England and New York that are likely to go via the Baltimore & Ohio System, to communicate before February 1 with Mr. A. J. Simmons, New England Agent, Baltimore & Ohio Railway, 211 Washington Street, Boston.

O. W. Peterson & Co.,

New England Agents

For

Standard Terra-Cotta Company,

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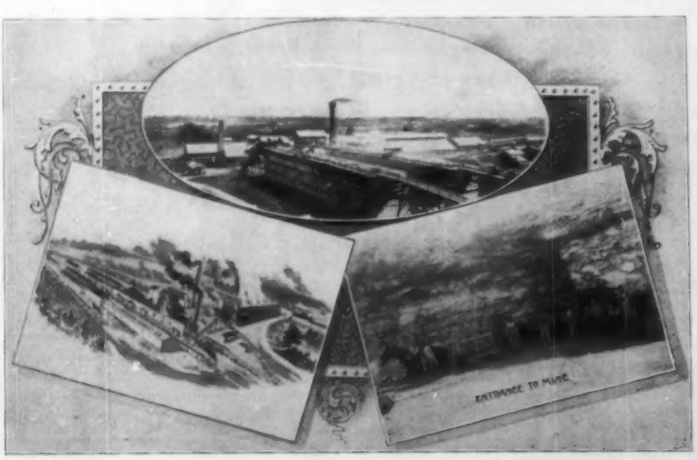

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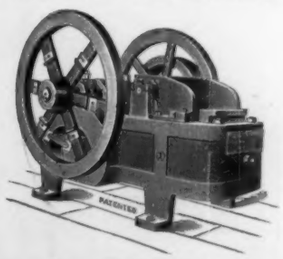

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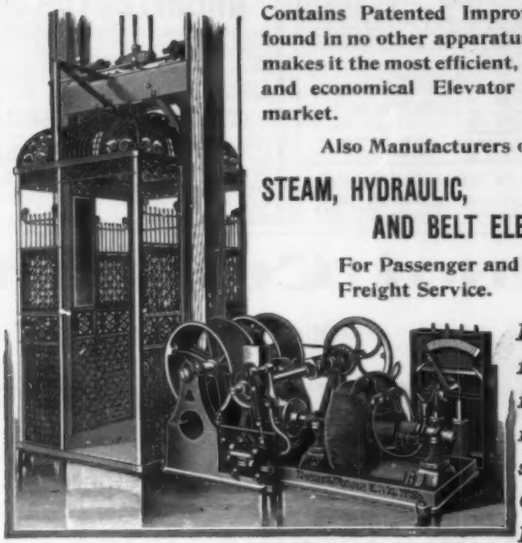

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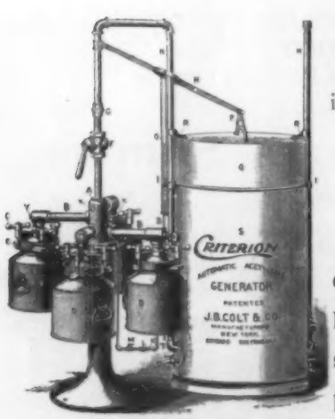

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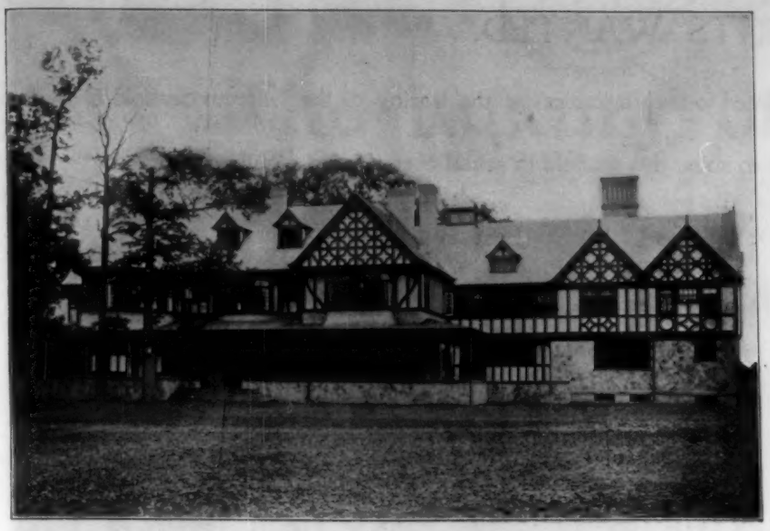

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Preference given to parties having an opportunity to show this scaffold in actual operation on a building.

Correspondence solicited.

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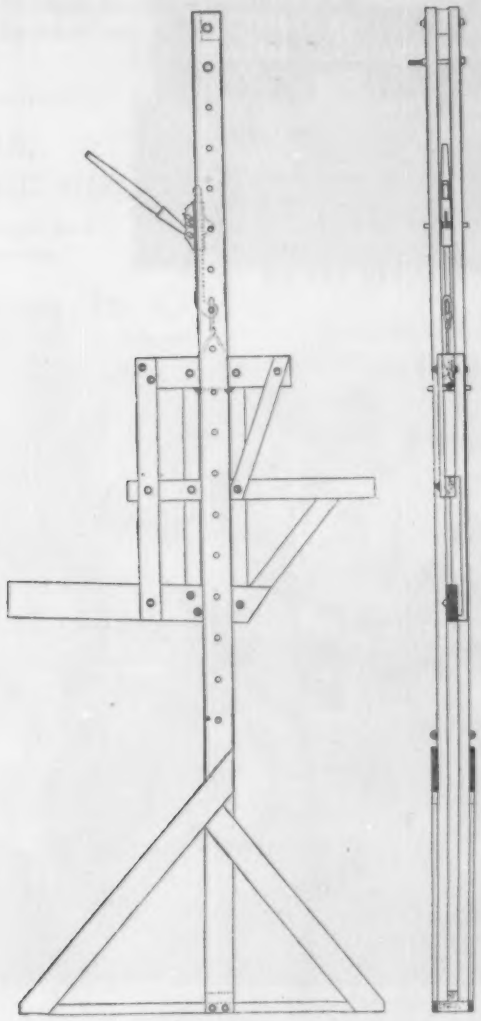

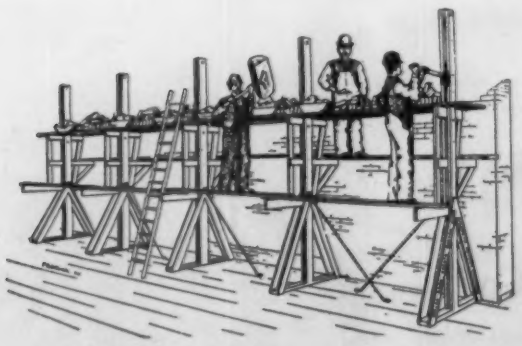

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is marred by hot water discolored from the galvanized iron kitchen boiler, which rusts inside and affords a lodging place for dirt. The smooth tin lining of the

Brown Brothers' Seamless Copper House Range Boiler

never rusts ; you can always get

CLEAN HOT WATER.

NO SEAMS. **NO RIVETS.** **NO LEAKS.**

Spiral Rib Guarantees Against Collapse.

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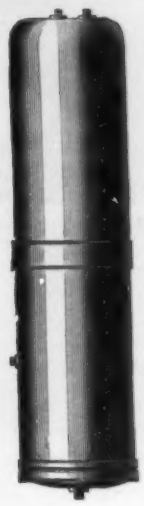

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Fine Sites for New Mills, Best of Freight Facilities — Coal Fields, Close Proximity to Distributing Centers, Intelligent Help of All Kinds, Many Kinds of Raw Material.

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered **TEXTILE INDUSTRIES** in the South by a number of good places.

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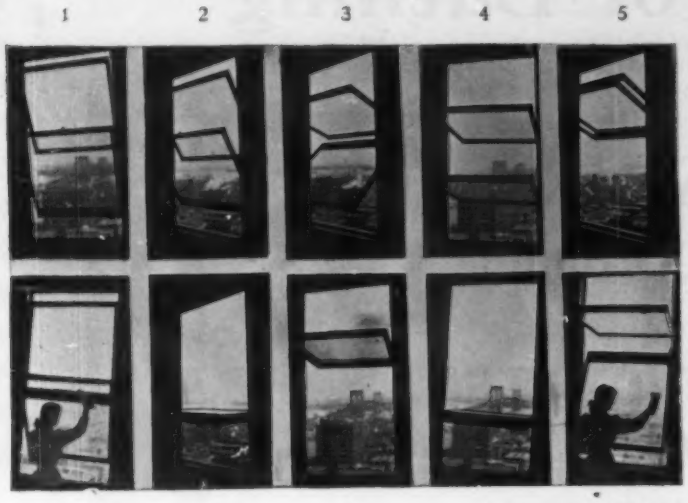
The Bolles Sliding Revolving Ventilating Safety Sash



The above pictures show a few of the many positions in which the "Bolles Sash" may be placed — each position having its own use and advantage.

1 and 2.— Ventilation without draught — protection also against rain.
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6.— Cleaning outside of upper sash with ease and safety.
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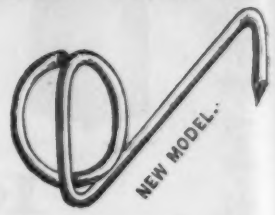
The Shull Overhead Window Pulley.

No sticking of sash. No dismounting of cord. 6 to 8 inches more pocket room means a saving in lead weights on short windows. Frame looks better because pulley is invisible when in place.

Shull's Mullion Pulleys for double and triple windows require no pocket between the frames.

Folsom Patent Roof Snow Guards

For old and new roofs. Slate, Shingle, Metal, or Tile roofs. Folsom method is scientific and displaces the guard rail.



The Folsom Snow Guard does not injure the roof.

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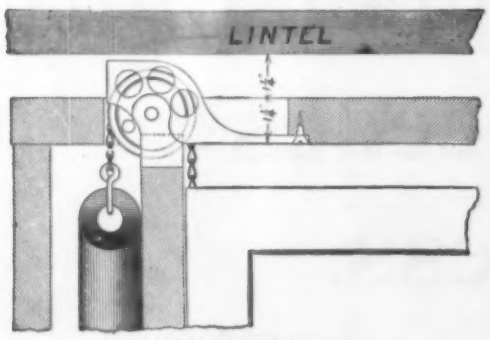
THE "QUEEN" SINGLE FRAME PULLEY.



The above cut shows a 2½ inch Pulley.

QUEEN PULLEYS.

Patented Sept. 21, 1897.

No Extra Head Room Needed.

No Grooving of Sashes. No Lead Weights.

Architects will note accompanying cuts. They represent a 2½ inch pulley that only requires 2½ inches head room from top of sash. Used in most difficult work.

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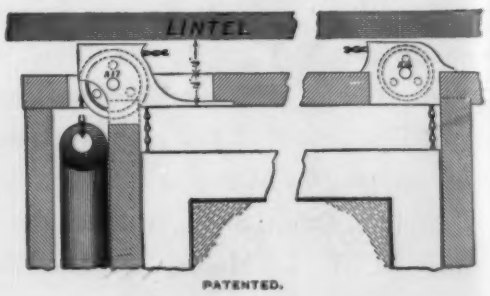
THE "QUEEN" MULLION FRAME PULLEYS.

One weight balances the Sash.



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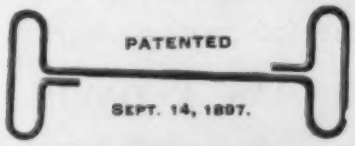
BONDING FACE BRICK, HOLLOW WALLS, ETC...

Perfectly Flat.



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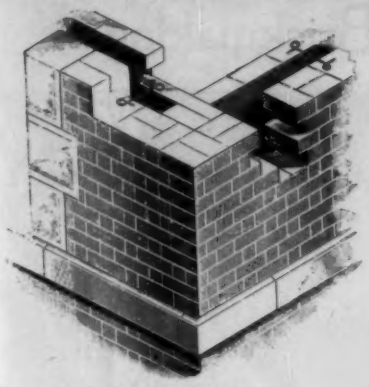

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The best and only perfect method is the

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Adds Strength.
Excludes all Moisture.
Simple and Cheap.

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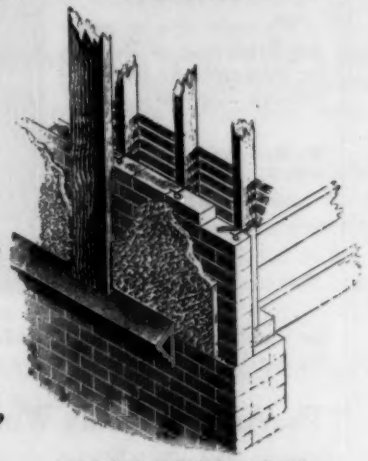

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Ornamental, Storm-proof, easily laid.

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Gothic Shingles 7 x 10 size. 10 x 14 " 14 x 20 "

Copper and Terne Plates.

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Ornamental, Storm-proof, Effective.

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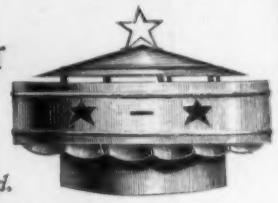

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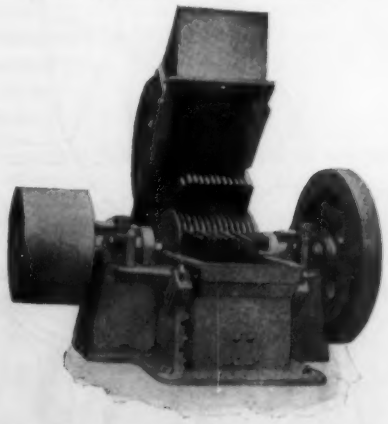
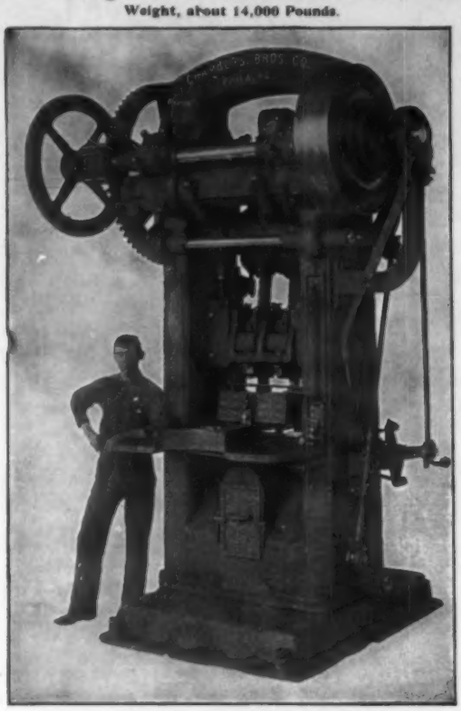


SOME CLAY WORKERS USING OUR MACHINES.

Hydraulic Press Brick Co., St. Louis, Mo. 3 machines.
Eastern Hydraulic Press Brick Co., Phila. 3 machines.
Anthony Ittner, Belleville, Ill.
Christy Fire Clay Co., St. Louis, Mo.
Denver Fire Clay Co., Denver, Col.
National Brick Co., Bradford, Pa.
Philadelphia & Boston Face Brick Co., Boston, Mass.
Quincy Press Brick Co., Quincy, Ill.
O. H. Sonsthagen, Christiana, Norway. 3 machines.
Sunset Brick & Tile Co., Gonzales, Tex.
Taylor & Raynes, Wagoner, I. T.

Power Repress for Plastic Brick.

Weight, about 14,000 Pounds.



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A strong, stiff machine, with all the pressing machinery above the mold box and away from the dirt. The finished brick is delivered up on a plate, and is never touched by the incoming clot. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gaged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is a repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness.

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IT NEVER BREAKS
IT RUNS SMOOTH AND NOISLESS
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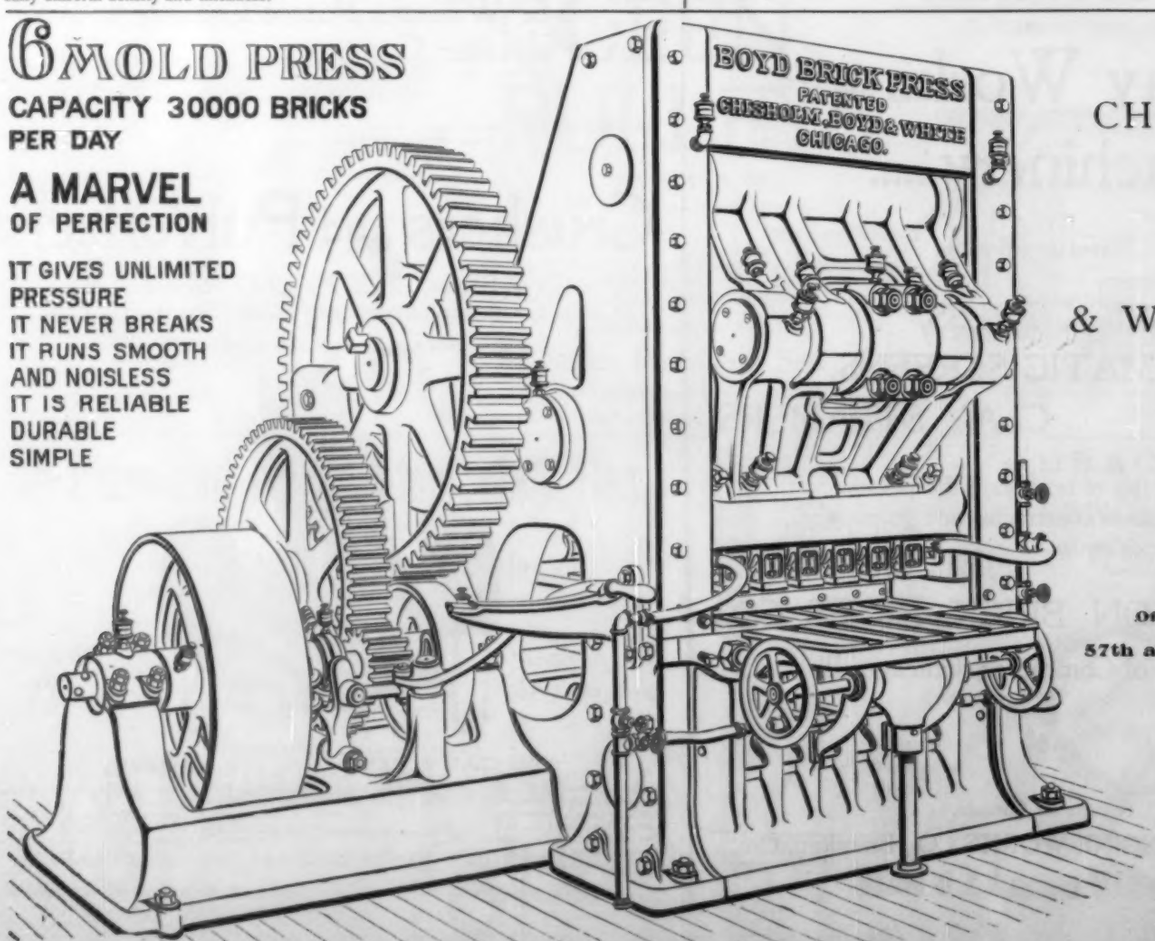

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Other Leading Articles for the Year.

PICTURESQUE BUILDING SITES.

By Henry P. Kirby. There will be two articles upon the subject, which will be illustrated from charming pen and ink sketches which Mr. Kirby has specially prepared for this series.

THE MINOR BRICK BUILDINGS OF FRANCE.

By William T. Partridge. There will be three articles in this series, which will be illustrated from Mr. Partridge's own collection of photographs and sketches of interesting small brick buildings, which are located in the smaller cities and towns of France.

THE ARTISTIC TREATMENT AND USE OF ROOFING TILE.

By W. A. Otis. In two articles upon this subject, Mr. Otis will illustrate some of the many artistic effects that may be obtained with roofing tile, and describe the best methods to be employed in laying them.

AMERICAN TILE WORK.

By Clarence H. Blackall. A summary of what has been accomplished in this line, and a description of the most notable work produced by our American manufacturers. This will be considered carefully from the artistic point of view as showing the possibilities of this art industry.

THE FORMAL GARDEN.

By Elmer E. Garnsey. In connection with this series, consisting of two articles, Mr. Garnsey will describe and illustrate some of the more interesting examples of foreign gardens, suggesting the possibilities in architectual effects that may be obtained at a reasonable cost by the use of terra cotta.

ARCHITECTURAL TERRA COTTA.

By Thomas Cusack. The valuable series of papers which have been contributed by Mr. Cusack under this general heading will be continued during the coming year. He will advocate a more general use of terra cotta and brick in the church architecture of the future and discuss the somewhat neglected subject of color combinations in plain and enamelled surface treatment; not only on exteriors, but in the vestibules, corridors, etc., of public buildings. Historical data will be cited, and in each case selected examples will be fully illustrated by drawings and photographs taken from successful work of recent execution.

ENGINEERING PROBLEMS RELATING TO ARCHITECTURE.

A series of papers which will deal with the every day problems of construction. Names of contributors announced elsewhere in this prospectus.

FIRE-PROOFING.

In this department, which is set apart especially for the discussion of up-to-date matters pertaining to fire-proof construction with burnt clay, there will be published a most valuable series of papers, descriptive of improvements that have been recently made in the construction of arches, partitions, etc. In addition to these, other papers will be contributed by leading authorities on fire-proof construction.

MORTARS AND CONCRETES.

This department is maintained for the purpose of furnishing that class of material which shall be an aid to architects and builders who recognize the necessity of care in successfully employing cements, and to that end a series of carefully prepared papers will be published during the year.

MASON CONTRACTOR.

In this department there will be published a series of papers which shall be alike of interest to architects and contractors.

Suggestions from our subscribers as to important questions needing practical discussion are solicited, and all such will be given due consideration.

BRICK AND TERRA-COTTA WORK IN AMERICAN AND FOREIGN CITIES.

The scope of this department will be somewhat enlarged upon during the coming year, and in addition to regular letters from the larger American cities with accompanying illustrations of current work, we shall publish two letters specially prepared for our columns by F. W. Fitzpatrick, on the Interesting Brickwork of Washington, D. C. These letters will be fully illustrated from photographs and sketches. An additional feature will be a contribution by William T. Partridge, on the Modern Brick Architecture of Paris. This, too, will be illustrated from photographs and sketches, which are to be prepared by Mr. Partridge during his forthcoming trip to France. Other interesting foreign brickwork, both old and new, will be shown in this department.

EDITORIAL AND CURRENT TOPICS.

Our editorials are contributed by a staff of able writers, and by them current topics of interest will be discussed.

CONTINUED FROM 1898.

Of the articles promised for, and serials begun during 1898, there remain to be published at least three more papers of Mr. Wheelwright's series on The American Schoolhouse, and Mr. Day's paper on Italian Brickwork. These will certainly appear in the early numbers of the year.

The reprint of Street's Brick and Marble in the Middle Ages will be continued as opportunity permits.

The Brickbuilder is published monthly at Boston, Mass.

By ROGERS & MANSON.

Subscription Price,
$2.50 per year.

Publication Office, 85 Water Street.

The Brickbuilder
for 1899 ... Prospectus

PLATE FORM OF SCALE DRAWINGS.

IN this department there will be reproduced each month, carefully selected scale drawings of the very best work being done in this country, wherein brick or terra cotta is employed. These illustrations will comprise elevations, plans, and details secured by personal solicitation from the best offices.

DRAWINGS AND PHOTOGRAPHS OF ENGLISH WORK.

We are assured by our representative now at London that we shall be privileged to publish during the year, drawings of some of the best current work of English architects. Arrangements having been perfected whereby our illustrating plates will be made at London, thus avoiding the necessity of sending drawings to this country, we feel reasonably certain of adding this desirable feature to our Plate Form. In addition to these drawings we shall illustrate from photographs recently secured, a number of English brick cottages, manor houses, college buildings, etc.

MEASURED DRAWINGS OF OLD FOREIGN WORK.

There will be published during the year, measured drawings of old foreign work, made especially for us by men holding travelling scholarships. These drawings consist chiefly of details of entrances, windows, cornices, string courses, etc.

Among those who will contribute to our columns during the year on architectural subjects are:—

CONTRIBUTORS TO LETTER PRESS.

Clarence H. Blackall,	F. W. Fitzpatrick,	William T. Partridge,
James Brite,	Elmer E. Garnsey,	Allen B. Pond,
Arthur G. Everett,	R. W. Gibson,	T. Henry Randall,
Ernest Coxhead,	Bertram G. Goodhue,	Julius A. Schweinfurth,
Ralph Adams Cram,	Julius F. Harder,	Russell Sturgis,
Thomas Cusack,	Thomas M. Kellogg,	R. Clipston Sturgis,
Frank Miles Day,	F. E. Kidder,	Edmund M. Wheelwright,
John Lyman Faxon,	Henry P. Kirby,	Peter B. Wight.
	W. A. Otis,	

Engineering subjects relating to architecture will be discussed by

Charles J. Everett, Jr.,
Frank S. Harrison,
Henry W. Hodge,
Corydon T. Purdy,
and Others.

Leading Articles for the Year.

COUNTRY CHURCH TO COST $50,000.

Following the plan inaugurated last year, of inviting a number of well known architects to contribute—each an article which shall be a treatment of some one building of the popular class, according to a program giving certain requirements, we have chosen for this year, two types; first,

A COUNTRY CHURCH TO BE BUILT OF BRICK AND TERRA COTTA.
Cost, $50,000.

The contributors will be

Ernest Coxhead	(Coxhead & Coxhead)	San Francisco.
Ralph Adams Cram	(Cram, Goodhue and Ferguson)	Boston.
Allen B. Pond	(Pond & Pond)	Chicago.
T. Henry Randall		New York.
R. Clipston Sturgis		Boston.

Second,

PUBLIC LIBRARY TO COST $100,000.

A PUBLIC LIBRARY TO BE BUILT OF BRICK AND TERRA COTTA.
Cost, $100,000.

The contributors will be

James Brite	(Brite & Bacon)	New York.
Arthur G. Everett	(Cabot, Everett & Mead)	Boston.
Julius F. Harder	(Israels & Harder)	New York.
Thomas M. Kellogg	(Rankin & Kellogg)	Philadelphia.
Julius A. Schweinfurth		Boston.

These articles will be illustrated from drawings and sketches of elevations, plans and details.

THE USE OF BURNT CLAY PRODUCTS FOR INTERIORS.

By Russell Sturgis. In two illustrated articles, Mr. Sturgis will show the possibilities of burnt clay as a medium for artistic interior work.

MONTEVENTOSO.

By Bertram Grosvenor Goodhue. Mr. Goodhue has been fortunate enough to unearth an hitherto unknown town on the northern slope of the Appenines, where he found some of the most notable brick and terra cotta architecture of North Italy. A description of this town, with sketches of its architecture, will be given in two numbers of next year.

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"New Haven" Brick Machinery,
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When we build, let us build well. Not only for our present delight and comfort, but that our works may be admired by those who come after us.

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Architects of All Ages

Have recognized the importance of combining art and utility whenever possible. Man first asks to be comfortably housed. Afterward, the æsthetic side of his nature seeks gratification. The architect or builder who bears these considerations in mind, and gives the most consistent expression to them, is the one who comes nearest to satisfying our wants.

Recognizing our inherent love for artistic variation and our constitutional objection to "sameness," we have produced the new and beautiful

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Its soft coloring is a pleasure to the eye, and makes it a welcome visitor among the strong, glaring effects that jar us on every hand. It harmonizes with all other colors and materials in decorations, and it is not subject to atmospheric influences. Practical as well as artistic reasons demand its use. Write for samples and prices.